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ABSTRACT

The purpose of the analysis was to provide a profile of instructional activities related to content and referenced to specified instructional outcome areas. Emphasis was placed on determination of four major factors: (1) major outcomes in the program and their relative emphasis in both regular and supplementary instructional materials, (2) the distribution of content within and across instructional units (chapters), (3) points in the instructional sequence where mastery of outcomes is assessed, and (4) the amount of independent practice in regular and supplementary instructional materials related directly to each major outcome developed in the program. The analysis was organized around 21 content strands, and is presented in a series of tables which indicate page locations of various topics. The completed analysis forms the basis for preliminary specification of an application of Learning Mastery System procedures to the system. (Author/SD)

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# SOUTHWEST REGIONAL LABORATORY TECHNICAL NOTE

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NO: TN 3-72-31

TITLE: CONTENT ANALYSIS OF ADDISON-WESLEY MATHEMATICS PROGRAM FOR ELEMENTARY GRADES K-6

AUTHORS: Aaron Buchanan, Elijah Babikian, Jim Winchester and Sylvia Auton

ABSTRACT

A content analysis was completed of the Addison-Wesley mathematics series for elementary grades. The purpose of the analysis was to provide a profile of instructional activities related to content and referenced to specified instructional outcome areas. Emphasis was placed on determination of:

1. major outcomes in the program and their relative emphasis in both regular and supplementary instructional materials.

2. the distribution of content within and across instructional units (chapters).

3. points in the instructional sequence where mastery of outcomes is assessed.

4. the amount of independent practice in regular and supplementary instructional materials related directly to each major outcome developed in the program.

The completed analysis forms the basis for preliminary specification of an application of Learning Mastery System procedures to the series.

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CONTENT ANALYSIS OF ADDISON-WESLEY MATHEMATICS PROGRAM FOR ELEMENTARY GRADES K-6

Aaron Buchanan, Elijah Babikian, Jim Winchester and Sylvia Auton

This document describes a content analysis of the Addison-Wesley mathematics series for elementary grades. The document is divided into three sections as follows:

Description of the Analysis. Procedures used by staff members of the Southwest Regional Laboratory for Educational Research and Development (SWRL) in performing the analysis are described. These procedures were used to generate descriptors of instructional outcomes from index entries in the Addison-Wesley teacher's editions and to determine the location of instructional and evaluation activities relevant to these outcomes in various Addison-Wesley components.

Interpretation of the Analysis. Procedures are recommended for identifying relationships in the analysis table between content organization, evaluation of outcomes, and provisions for individual practice, and for comparing these relationships with those desired in application of a Learning Mastery System.

Preliminary Specifications of a Learning Mastery System Application. Broad preliminary specifications for the architecture of an application of a Learning Mastery System to the Addison-Wesley series are presented. These specifications include: (1) a discrete number of broad instructional outcomes that can serve as a unifying structure for assessing pupil progress through various levels of the program, (2) suggested evaluation components, and (3) materials suitable for individual prac-

tice on outcomes assessed in LMS throughout the program.

## DESCRIPTION OF THE ANALYSIS

### CONTENT STRANDS

The analysis is organized around twenty-one vertical strands of content identified by Addison-Wesley as basic units of a program structure. These strands are listed below in the order of their appearance in the program scope and sequence chart in each teacher's edition.

Set Concepts
Place Value
Operations
Sequences
Inequalities
Notation
Number Facts
Equations and Solutions
Number Line
Basic Principles
Processes (Algorithms)
Rational Numbers
Ratio and Proportion
Problem Solving
Logic
Number Theory
Estimation
Measurement
Geometry
Graphs and Scale Drawings
Special Topics

### OUTCOME DESCRIPTORS

For each strand and substrand, a set of outcome descriptors has been prepared by SWRL staff to describe the content at each level of the program. These descriptors are statements of expected outcomes of

instruction. An example of descriptors for the "Place Value" strand in Grade 5 is shown below.

1. Read and write numerals

   Thousands
   Millions
   Billions to Quintillions

2. Identify place values of digits in numerals

   Whole numbers
   Decimal numbers

3. Recognize numerals in different bases

   Base-10 numerals
   Base-4 numerals

4. Represent numerals in expanded form

5. Write numerals using different notations

   Exponential notation
   Decimal notation

6. Represent numbers by concrete models

   Abacus
   Base ten machine

Outcome descriptors were derived using the following procedures:

1. All entries in the index of the teacher's edition were partitioned according to content strands listed in the scope and sequence chart. Since scope and sequence entries overlapped among some strands, elementary priorities in classification were followed which eliminated most of the multiple listing of index entries.

2. Within each strand, index entries were translated into a small set of statements of intended mathematical behaviors (outcome descriptors). In some instances, the descriptors are comprehensive, and no

subordinate outcomes are included; in other instances, subordinate outcomes are included because major portions of the instructional materials were devoted to their review.

TABLE ENTRIES

Instructional activities (designated lessons) from the core components of the Addison-Wesley program were classified according to the prespecified outcome descriptors. The core components used were the student text (teacher's edition), the student workbook, and a separate battery of chapter tests. Since the purpose of the analysis was to obtain a profile of instructional activities, an exhaustive listing of all activities included in all components was not necessary. Diagnostic tests were not included because they were chapter pretests which paralleled the structure and function of chapter tests. A description of major supplementary program components is in Appendix A.

Entries in the table refer to page numbers in the student text and workbook, and the chapter tests where instructional activities pertinent to the outcome descriptor are located. For each entry, the number of items or problems directly related to the outcome descriptor was determined. It was reasoned that item frequencies directly related to an outcome descriptor are better indicators of the amount of independent practice provided in a chapter for each outcome than are page entries. In determining item frequencies the number ten was chosen as a cutoff point since most instructional activities related principally to major outcomes contained at least ten items of practice. An entry of (10) following a set of page entries or a chapter test indi-

cates that ten or more items providing direct practice on the outcome were found.

During the course of the analysis, it became necessary to develop conventions for determining item frequencies. Items were counted according to the number of separate responses requiring direct outcome-related performances. In some instances, such as the reproduction of counting sequences, individual responses were not independent of each other. In this case, each separate sequence was counted as a response. In many instances, mastery of a particular outcome, such as recognition of commutativity of addition, would be helpful in making a response, but unnecessary. Where responses could be made as a result of acquisition of some other outcome, especially an outcome that is learned rather early in the instructional sequence (such as recognition of number facts), no items were recorded with the descriptor. Conventions were also developed for classifying problems in activities involving either number line or semi-concrete pictorial models to solve equations. While use of the model might be helpful in making a required response, it was seldom required that the model be interpreted; a recall of basic number facts or the application of some computation algorithm was usually sufficient. In instances such as these, an item was recorded for purposes of the analysis with a descriptor involving "models" if there were separate representations of the model for each equation.

Actual entries for a particular descriptor are coded as follows:

1. Pages from the student text (or student pages from the teacher's edition) appear in regular typeface with the number of items, to 10, following in parentheses.

2. Pages from the student workbook and the number of related items, to 10, are underlined.

3. Chapter test entries are preceded by CT with the number of items related to the descriptor following.

## INTERPRETATION OF THE ANALYSIS

### CONTENT STRANDS

The distribution of content in the program can be inferred from the analysis in the following ways:

1. Examination of Instruction and Evaluation Entries for a Particular Outcome Across Chapters and Levels. It is possible to draw some conclusions concerning the independence of one outcome from another. If there are several instructional entries, but few review or evaluation entries, it is possible to infer that this outcome cannot be easily separated from other outcomes during instruction. This inference is related to methods used in development of the analysis. The major source of instruction entries (textbook) was the index of teacher's editions at each level. Since index entries are likely to be classified with as many content domains as are possibly relevant, there was some multiple classification among instructional entries. Review and evaluation entries, on the other hand, were made from a page-by-page analysis of the components. In this case, multiple classification was avoided wherever possible, and activities were referenced to the outcome with the most appropriate descriptor. Most of the multiple classification, which is not extensive in Addison-Wesley, occurs in "Operations",

"Number Facts", "Processes" and "Rational Numbers". For example, operations on rational numbers were often classified under both "Rational Numbers" and "Processes".

2. Examination of Entries in the Chapter Columns. For purposes of a Learning Mastery System it is desirable that content included in each chapter be reasonably homogeneous. Unit division should be determined primarily by outcomes to be acquired and their presentation sequence. The instructional entries in each chapter should be spread over no more than 7 or 8 outcomes if evaluation of mastery is to retain some reliability and tests are to remain a reasonable length. Where chapters in Addison-Wesley provide instruction on more outcomes than this, it may be necessary to defer assessment of some outcomes until they are represented in a subsequent chapter.

3. Examination of all Descriptors for a Particular Content Strand over all Levels of the Program. If there are very few descriptors that differ distinctly, or if the set of descriptors show little hierarchical relationship, the strand probably does not possess strong sequential characteristics of its own. Frequently, as in "Problem Solving", the strand exists primarily for the inclusion of activities where mathematical skills are applied to verbal or pictorial problems. Some strands, such as "Set Concepts" in Levels K-3, exist principally as a model for whole numbers and related operations. By comparison, material devoted directly to the development of concepts related to sets and set theory is relatively minor.

OUTCOME ASSESSMENT

Instructional entries frequently occur in the analysis with no accompanying evaluation entries. In general, this circumstance implies one of the following:

1. Evaluation is deficient

2. Instruction is primarily in the form of teacher explanation with little or no independent practice for the pupil.

3. Instruction and practice on a particular outcome cannot be separated from a more inclusive outcome.

4. The outcome is minor in comparison to the amount of instruction given on other skills presented in the unit.

The number of items per skill-per unit averages 3-4 for major skills and 1-3 for minor skills. Item frequencies such as these may be adequate in skill maintenance or retention, but should probably be increased in criterion exercises where acquisition of new or extended skills is assessed.

INDEPENDENT PRACTICE

The amount of independent practice on each outcome can be determined by attending to the numbers in parentheses following underlined and non-underlined page entries. Of primary interest are instances where instructional entries (regular instruction and review) are associated with fewer than ten items of independent practice. The number ten was chosen as a reference point for the analysis since many activities approached but did not exceed this number. It was reasoned that outcomes with fewer than ten items of practice, and

particularly outcomes with fewer than five or six items, do not provide sufficient practice for attainment of the skill.

## PRELIMINARY SPECIFICATIONS OF A LEARNING MASTERY SYSTEM APPLICATION

### CONTENT STRANDS

The strands of content related to the arithmetic of whole and rational numbers are dominant. This may be inferred by inspecting the number of outcomes developed (as represented by outcome descriptors) and the number of instructional entries per outcome. Outcomes developed in these strands, as well as most of their substrands, usually include at least 10 items of independent practice. Strands such as "Operations" and, at earlier levels, "Number Theory", could contain so many outcome descriptors in common with other strands that it is doubtful their preservation as independent outcome areas in a Learning Mastery System would be worthwhile. In general, the number of content domains (twenty-one) will be reduced by combining domains in an application of the Learning Mastery System.

### INSTRUCTIONAL OUTCOMES

Five or six broad outcomes such as the following likely will be recommended as a basic outcome structure for the development of Learning Mastery System procedures:

1. Recognize basic elements and concepts
2. Decode systems of symbols
3. Express mathematical relationships
4. Verify mathematical relationships

5. Perform operations

6. Solve verbal problems

One or more of these outcomes represent major skills to be developed in each of content domains such as the following:

I. Sets

II. Whole numbers

III. Rational numbers (positive)

IV. Integers

V. Geometry

VI. Measurement

VII. Logic

Pupil progress through broad instructional sequences for outcomes applicable to each content domain will be monitored throughout the program. At each level, a set of outcome descriptors will further refine cells in the outcome-content matrix to reflect all of the content included in the program for that level.

EVALUATION COMPONENTS

In a number of instances recognition of properties of mathematical operations is introduced through verbal instructions given by the teacher. Pupils are encouraged but not required to recognize these properties in solving related equations or problems. Acquisition of skills such as these should not be assessed in a Learning Mastery System until approximately 10 items of independent practice have been provided in a single chapter.

Occasionally chapters contain instructional entries classified under outcome descriptors which are peripheral to major skills under development. The major focus in chapters such as these will be assessment of outcomes introduced and any of their prerequisites which are reviewed. In chapters where no instruction on new outcomes is begun, the principal outcomes under review will be evaluated. The context for evaluation should include settings which parallel those used during regular instruction, but they should also include some transfer settings which may be generally familiar to the pupil but not in association with the outcome under development. In general, there should not be more than two or three items of the latter type for any particular outcome developed in a chapter.

LMS evaluation components for Addison-Wesley should include the following:

1. Four to Six Pretests for Each Level. The number of pretests will be determined by the number of major breaks in the continuity of the instructional sequence. It will not be necessary to specify a pretest for each chapter, since many follow directly from the previous chapter. Essentially, all of the information which might be of value to the teacher can be obtained from posttest or criterion exercise instruments for the previous unit. Pretests should provide a comprehensive sample of behaviors that are prerequisite to the major skills developed in the chapter. The information obtained from the pretest should guide the teacher in determining the relative emphasis to be given any prerequisite behaviors which are reviewed

prior to the introduction of new material. Efforts will be made to use existing Addison-Wesley Diagnostic Tests, although sections of these pretests are not clearly structured according to outcomes.

2. En-route Assessment Devices for Each Major Outcome Introduced or Reviewed. A limited number of problems in the regular daily assignment will be identified which the teacher can review as a check on the progress of the pupil toward mastery of the outcome.

3. End-of-Unit Criterion Exercise for Each Unit. Each exercise should include at least one section for each of the major outcomes on which instruction was provided in that unit. Approximately 4-5 items should be included for each individual outcome representing material which has been introduced or extended. One or two items should be included for each descriptor where previously mastered skills have been reviewed or maintained.

Each exercise should include a limited number of problems where computational skills which have been developed are applied to the solution of verbal problems. The format for all items on the criterion exercise should be multiple choice with at least some of the distractors representing typical errors which might be made on this type of problem.

SWRL-developed instruments are recommended over existing Addison-Wesley Chapter Tests for the following reasons:

(1) Addison-Wesley Chapter Tests are not clearly organized around instructional outcomes.

(2) Many outcome areas are evaluated with fewer than 4 items per instrument.

(3) The constructed response format used with items is incompatible with machine scoring and remedial practice based on typical errors.

(4) In Levels 3 and 4, no components for formal evaluation of Geometry units are presently available.

PRACTICE COMPONENTS

Appropriate practice materials should be developed as part of the LMS. Wherever possible, supplementary practice should be provided in such a way that the teacher can select exercises on the basis of major types of errors committed.

SUPPORT COMPONENTS

Various support components, including a technical manual and appropriate record keeping materials will also be provided.

## APPENDIX A

### DESCRIPTION OF ADDISON-WESLEY COMPONENTS

(1) Diagnostic tests-A battery of 12 diagnostic tests, with 15-20 items per test, is provided for use prior to instruction in each chapter. The tests are designed to identify students in need of special help on material to be presented in the chapter. Items on all of the tests are parallel to problems provided for practice during regular instruction. They sample from all material, both introduced and reviewed. Test items and sections are not referenced to particular pages in the student text or teacher's edition. No references are given in the teacher's edition for use of the tests.

(2) Duplicating Masters-A set of duplicating masters is provided for each of Levels 1-6. Approximately 90 masters are available for Levels 1 and 2, and 60 masters for each of Levels 3-6. These masters contain problems which are parallel to problems included in the student's text. Points where duplicating masters are to be given are designated on each master. No references are given in the teacher's edition for use of the masters during regular instruction.

(3) Workbook-A workbook for each of Levels 3-6 provides approximately 95 pages of practice problems parallel to material in the student's text. Each practice page is associated with a specific page in the student's text as designated in a correlation chart

located in the workbook. No reference to use of workbooks is given in the teacher's edition.

(4) "Getty Ready" Books-Readiness books are provided for each of Levels 3-6. Each book includes 48 pages with activities which review material presented in the previous grade level.

(5) Chapter and Term Tests-A battery of tests is provided for use after instruction in each chapter. One test of approximately 20 items is available for each chapter. Two additional tests are to be used at midyear and after completion of the textbook. Items on all of the tests are parallel to problems provided for practice during regular instruction. Test items and sections are not referenced to particular pages in the student's text. No references are given in the teacher's edition to use of this battery.

# APPENDIX B

## CONTENT ANALYSIS

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
PRIMER



| UNIT<br>PAGES | 1<br>1-14 | 2<br>15-20 | 3<br>21-34 | 4<br>35-46 | 5<br>47-80 |
|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | |
| 1. Compare set membership by identifying common property (function) of elements | | 15-16(8)[a] | | | |
| 2. Recognize equivalent sets by placing elements in 1-1 correspondence | | | 25-30(10) | | |
| 3. Identify numeral for number of elements in a set (introduction) | | | | | |
| Sets to 0 (Empty set) | | | | 43-6(6) | |
| 1 | | | | 35,39-46(10) | |
| 2 | | | | 36,39-46(10) | |
| 3 | | | | 37,39-46(10) | |
| 4 | | | | 38-46(10) | |
| 5 | | | | | 47-50(10) |
| 6 | | | | | 51-4,56(10) |
| 7 | | | | | 57-60(10) |
| 8 | | | | | 61-4,66(10) |
| 9 | | | | | 67-70(10) |
| 10 | | | | | 71-4,76-8(10) |
| 4. Identify number of elements in union of a set with one element and a set with 4-9 elements (combinations with one) | | | | | 47,49,51, 57,61,67, 71(10) |
| 5. Identify number of elements in each of two given subsets and the number in their union set (Intuitive addition and subtraction-Combinations with numbers other than one) | | | | | |
| Union set to 5 | | | | | 47,49,50(8) |
| 6 | | | | | 51,53-4(9) |
| 7 | | | | | 57,59-60(9) |
| 8 | | | | | 61,63-4(8) |
| 9 | | | | | 67,69-70(9) |
| 10 | | | | | 71,73-4(10) |
| | | | | | 78,80 |
| II. PLACE VALUE (No Outcomes) | | | | | |
| III. OPERATIONS (No Outcomes) | | | | | |

[a] Numerals refer to student pages in teacher's edition. Numeral in parentheses indicates the number of problems (to 10) in the chapter in which principal practice is on the outcome described.

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
PRIMER



| UNIT<br>PAGES | 1<br>1-14 | 2<br>15-20 | 3<br>21-34 | 4<br>35-46 | 5<br>47-80 |
|---|---|---|---|---|---|
| IV. SEQUENCES<br>1. Order numerals in counting sequence<br>To 6<br>To 8<br>To 10 | | | | | 55(3)<br>65(3)<br>75(3) |
| V. INEQUALITIES<br>1. Compare objects by size (larger, smaller, largest, smallest, longer, shorter, taller, tallest) | 1-7,9(10) | | | | |
| 2. Compare sets (more, less) | | | 21-4,31-2(10) | | |
| 3. Identify and/or construct set with one more element than given set | | | 33-4(6) | | |
| VI. NOTATION<br>1. Recognize numerals 1-10 | (See I-2) | | | | |
| VII. NUMBER FACTS<br>1. Identify number of elements in missing subset, given one subset and the number of elements in the union set (Intuitive introduction to subtraction-Missing addend) | | | | | 79(10) |
| VIII. EQUATIONS AND SOLUTIONS<br>(No Outcomes) | | | | | |
| IX. NUMBER LINE (No Outcomes) | | | | | |
| X. BASIC PRINCIPLES<br>1. Recognition of commutative principle (intuitive) | | | | | 79(10) |
| XI. PROCESSES (ALGORITHMS)<br>(No Outcomes) | | | | | |

LMS MATH

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
PRIMER

| UNIT<br>PAGES | 1<br>1-14 | 2<br>15-20 | 3<br>21-34 | 4<br>35-46 | 5<br>47-80 |
|---|---|---|---|---|---|
| XII. RATIONAL NUMBERS (No Outcomes) | | | | | |
| XIII. RATIO AND PROPORTION (No Outcomes) | | | | | |
| XIV. PROBLEM SOLVING<br>1. Interpret "rebus" problems | | | | | 47,49,51,61,<br>71(10) |
| XV. LOGIC<br>1. Complete geometric patterns | (See XXI) | | | | |
| XVI. NUMBER THEORY (No Outcomes) | | | | | |
| XVII. ESTIMATION (No Outcomes) | | | | | |
| XVIII. MEASUREMENT (No Outcomes) | | | | | |
| XIX. GEOMETRY<br>1. Compare objects by similarities and differences in shape<br>Differences<br>Similarities | <br><br>11-12(8)<br>8,10(8) | | | | |
| 2. Identify objects by relative position (inside, outside, above, below, beside, on) | 8,9(10) | | | | |
| XX. GRAPHS AND SCALE DRAWINGS (No Outcomes) | | | | | |
| XXI. SPECIAL TOPICS<br>1. Complete geometric patterns<br>Geometric figures<br>Sequential patterns | <br><br>13-14(6) | <br><br>17-20(10) | | | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1



| UNIT<br>PAGES | 1<br>1-10 | 2<br>11-38 | 3<br>39-56 | 4<br>57-72 | 5<br>73-96 | 6<br>97-152 | 7<br>153-198 |
|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | |
| 1. Recognize cardinal number property of sets | | | | | | | |
| Sets of 1 | | 11,15-32(10) | 45-48(2) | | | | |
| 2 | | 12,15-32(10)/ CT(1) | 45-48(4) | | | | |
| 3 | | 13,15-32(10)/ CT(1) | 45-48(4) | | | | |
| 4 | | 14-32(10)/ CT(1) | 45-48(3)/ CT(1) | | | | |
| 5 | | 19-32(10)/ CT(1) | 45-48(4)/ CT(1) | | | | |
| 6 | | 21-32(10)/ CT(1) | 45-48(4)/ CT(1) | | | | |
| 7 | | 23-32(10)/ CT(1) | 45-48(3) | | | | |
| 8 | | 27-32(10)/ CT(2) | 45-48(4)/CT (1) | | | | |
| 9 | | 29-32(6)/ CT(1) | 45-48(3) | | | | |
| 10 | | | | | | | 154-156(10)/ CT(3) |
| 2. Recognize special sets | | | | | | | |
| Empty set | | 35-36(3)/ CT(1) | | | | | |
| Equivalent sets | 6(2) | | | | | | |
| Subsets | | | | | 75-80(10)/ CT(2) | | |
| 3. Compare sets | | | | | | | |
| Using one to one matching | 3-6(5)/CT (1) | | | | | | |
| By indicating more than, less than | 1,2,7,8(10)/ CT(2) | | | | | | |
| By indicating one more than | 9,10(7)/ CT(1) | | | | | | |

[b] Numerals preceded by CT refer to the number of items on the chapter test (independent battery of chapter tests) which involve primarily the outcome described.

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1

| UNIT<br>PAGES | 1<br>1-10 | 2<br>11-38 | 3<br>39-56 | 4<br>57-72 | 5<br>73-96 | 6<br>97-152 | 7<br>153-198 |
|---|---|---|---|---|---|---|---|
| 4. Relate operations on whole numbers to sets | | | | | | | |
| Addition (joining of sets) | | | | 57-66(10)/ CT(1) | | | |
| Subtraction (separation of sets) | | | | | 73-80(10)/ CT(2) | | |
| II. PLACE VALUE | | | | | | | |
| 1. Relate the word "ten" to a set of 10 | | | | | | | 152(2) |
| 2. Recognize the number of elements of sets grouped by | | | | | | | |
| Tens | | | | | | | 154-156,163-164,167(10)/ CT(3) |
| Tens and ones | | | | | | | 157-160,168-170(10)/ CT(3) |
| 3. Associate numerals for whole numbers with place values by rewriting numerals for numbers less than one hundred | | | | | | | |
| Write place values for given numerals | | | | | | | 162,166(10) |
| Write numerals for given place values | | | | | | | 159-161,163-165(10) |
| III. OPERATIONS | | | | | | | |
| 1. Add and subtract whole numbers | | | | | | | |
| Sums to 10 | | | | 61-68(10)/ CT(7) | | 97-152(10)/ CT(5) | |
| Sums greater than 10 | | | | | | | |
| Sums of 3 or more digits | | | | | | | |
| Differences and missing addends | | | | 69-72(10)/ CT(2) | 73-86(10)/ CT(9) | 97-152(10)/ CT(5) | |
| 2. Recognize inverse relationship between addition and subtraction | | | | | 87-92(10)/ CT(4) | 106,118,134,148(10)/ CT(2) | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1



| UNIT<br>PAGES | 1<br>1-10 | 2<br>11-38 | 3<br>39-56 | 4<br>57-72 | 5<br>73-96 | 6<br>97-152 | 7<br>153-198 |
|---|---|---|---|---|---|---|---|
| IV. SEQUENCES | | | | | | | |
| 1. Place numerals in counting sequence | | | | | | | |
| To 99 | | | 50(6)/ CT(1) | | | | 175,183(9) |
| Within decades | | | | | | | 171(8)/ CT(2) |
| One decade to the next | | | | | | | 173-174(10) |
| Connect numbered dots | | | 44(9)/CT(1) | CT(1) | CT(1) | CT(1) | 177-178, 181-184(5)/ CT(1) |
| 2. Indicate numbers (before, after, before and after, between) | | | | | | | 172,176(10) |
| V. INEQUALITIES | | | | | | | |
| 1. Compare two whole numbers by | | | | | | | |
| Identifying number "less than" or "greater than" a specified number | | | 53-54(10)/ CT(1) | | | | 192(10) |
| Using symbols <, >, = | | | 56(10)/ CT(2) | | | 108,122,129, 150(10) | 186-190(10)/ CT(2) |
| Completing an inequality statement with a number | | | | | | | 191(10) |
| Comparing unequal sets | | | 51-52,55(9)/ CT(1) | | | | |
| 2. Compare money values by indicating more or less | | | | | | | 193-194(10) |
| VI. NOTATION | | | | | | | |
| 1. Recognize digits 1-9* | | 11-15,19-32, (10)/CT(8) | | | | | |
| 2. Write numerals 1-9 | | | 39-44(10)/ CT(10) | | | | |

*Outcomes designated with (*) are reinforced throughout the text.

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1

| UNIT<br>PAGES | 1<br>1-10 | 2<br>11-38 | 3<br>39-56 | 4<br>57-72 | 5<br>73-96 | 6<br>97-152 | 7<br>153-198 |
|---|---|---|---|---|---|---|---|
| 3. Write two digit numerals from an expanded place value notation | (See II-3) | | | | | | |
| 4. Write two digit numerals as expanded notation sums | | | | | | | |
| 5. Recognize and interpret symbols <, >, + - ¢ () | (See also V-1) | | 55(4)/CT(2) | 59-60(6) | 73-74(6) | 123-124(7)/ CT(1) | |
| 6. Use vertical algorithm in simple computations<br>Addition<br>Subtraction | | | | 64(10)/CT(1) | 78(10)/CT(1) | | |
| VII. NUMBER FACTS<br>1. Recall addition and subtraction facts by providing answers for simple problems<br>Sums through 9<br>Sums of 10<br>Sums through 18 | | | | 61-72(10)/ CT(9) | 73-86(10)/ CT(9) | 97-152(10)/ CT(10) | |
| VIII. EQUATIONS AND SOLUTIONS<br>1. Interpret equations using □ notation (Introduction)<br>Addition<br>Subtraction | | | | 61-63(10)/ CT(9) | 75-77(10)/ CT(6) | | |
| IX. NUMBER LINE<br>1. Illustrate order of whole numbers on the number line | | | 49(3)/CT(1) | | | | |

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GRADE 1



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|---|---|---|---|---|---|---|---|
| 2. Recognize operations represented on the number line | | | | | | | |
| Addition | | | | 67(4)/CT(1) | | | |
| Subtraction | | | | | 81(4)/CT(1) | | |
| X. BASIC PRINCIPLES | | | | | | | |
| I. Recognize and use basic principles for addition and subtraction operations | | | | | | | |
| Commutative principle | | | | | 93-94(10)/ CT(1) | | |
| Associative principle | | | | | | | |
| Zero principle | | | | 66(10) | | | |
| Use of parentheses (grouping) | | | | | | | |
| XI. PROCESSES (ALGORITHMS) | | | | | | | |
| In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XII. RATIONAL NUMBERS | | | | | | | |
| 1. Recognize fractions as descriptors of relationships between equivalent subsets and subregions | | | | | | | |
| 1/2 | | | | | | | |
| 1/3 | | | | | | | |
| XIII. RATIO AND PROPORTION | | | | | | | |
| In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | |
| 1. Solve simple word-picture problems involving | | | | | | | |
| Number of pennies in a set | | 33-34(7)/ CT(1) | | | | | |
| Total value of a group of pennies, nickles and dimes | | | | | | | 179-180(6)/ CT(1) |

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|---|---|---|---|---|---|---|---|
| Addition using nickles and pennies | | | | | | 123(2)/CT(1) | |
| Subtraction using nickles and pennies | | | | | | 124(3) | |
| Adding costs of objects | | | | | | | |
| Making change | | | | | | | |
| XV. LOGIC | | | | | | | |
| 1. Use informal logic in reasoning with | | | | | | | |
| Addition and subtraction-inverse relationship | | | | | 87-92(10)/CT(3) | 118(6)/CT(2) | |
| Sums greater than 10 | | | | | | | |
| Subtraction | | | | | | | |
| XVI. NUMBER THEORY | | | | | | | |
| 1. Recognize and complete number sequences | | | | | | | |
| Odd number sequence | | | | | | | |
| Even number sequence | | | | | | | |
| Counting by 3's | | | | | | | |
| Counting by 4's | | | | | | | |
| Counting by 5's | | | | | | | |
| Counting by 10's | | | | | | | |
| XVII. ESTIMATION | | | | | | | |
| In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XVIII. MEASUREMENT | | | | | | | |
| 1. Recognize and use systems for linear measure | | | | | | | |
| Unit of length comparisons | | | | | | | |
| Inch | | | | | | | |
| Centimeter | | | | | | | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1



| UNIT / PAGES | 1<br>1-10 | 2<br>11-38 | 3<br>39-56 | 4<br>57-72 | 5<br>73-96 | 6<br>97-152 | 7<br>153-198 |
|---|---|---|---|---|---|---|---|
| 2. Recognize and use systems for capacity measure<br>Cup<br>Pint<br>Quart | | | | | | | |
| XIX. GEOMETRY<br>1. Recognize and discriminate various geometric figures<br>Triangle<br>Square<br>Circle<br>Rectangle | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS<br>In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XXI. SPECIAL TOPICS<br>1. Tell time by indicating the correct time on a clock-face model<br>To the hour<br>To the half-hour | | | | | | | 195-198 (10)<br>198 (3) |
| CUMULATIVE REVIEWS ("Looking Back") | | | | | | | |

LMS MATH

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1

| UNIT<br>PAGES | 8<br>199-222 | 9<br>223-234 | 10<br>235-258 | 11<br>259-268 | 12<br>269-288 | 13<br>289-296 | |
|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | |
| 1. Recognize cardinal number property of sets | | | | | | | |
| Sets of 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 2. Recognize special sets | | | | | | | |
| Empty set | | | | | | | |
| Equivalent sets | | | | | | | |
| Subsets | | | | | | | |
| 3. Compare sets | | | | | | | |
| Using one to one matching | | | | | | | |
| By indicating more than, less than | | | | | | | |
| By indicating one more than | | | | | | | |
| 4. Relate operations on whole numbers to sets | | | | | | | |
| Addition (joining of sets) | | | | 259(0)/CT(1) | | | |
| Subtraction (separation of sets) | | | | 259(0)/CT(1) | | | |
| II. PLACE VALUE | | | | | | | |
| 1. Relate the word "ten" to a set of 10 | | | | | | | |
| 2. Recognize the number of elements of sets grouped by | | | | | | | |
| Tens | | | | | | | |
| Tens and ones | | | | 267(3) | | | |

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GRADE 1



| UNIT<br>PAGES | 8<br>199-222 | 9<br>223-234 | 10<br>235-258 | 11<br>259-268 | 12<br>269-288 | 13<br>289-296 | |
|---|---|---|---|---|---|---|---|
| 3. Associate numerals for whole numbers with place values by rewriting numerals for numbers less than one hundred | | | | | | | |
| Write place values for given numerals | | | 240(10) | | | | |
| Write numerals for given place values | | | 239(10) | | | | |
| III. OPERATIONS | | | | | | | |
| 1. Add and subtract whole numbers | | | | | | | |
| Sums to 10 | 199-222(10)/ CT(6) | | | | | | |
| Sums greater than 10 | | | 243-258(10)/ CT(6) | CT(1) | | | |
| Sums of 3 or more digits | | | 256(6) | | | | |
| Differences and missing addends | 199-222(10)/ CT(5) | | | 259-266(10)/ CT(8) | | | |
| 2. Recognize inverse relationship between addition and subtraction | | | | | | | |
| IV. SEQUENCES | | | | | | | |
| 1. Place numerals in counting sequence | | | | | | | |
| To 99 | | | | | | | |
| Within decades | | | | | | | |
| One decade to the next | | | | 267(3) | | | |
| Connect numbered dots | CT(1) | CT(1) | CT(1) | CT(1) | CT(1) | | |
| 2. Indicate numbers (before, after, before and after, between) | | | | | | | |
| V. INEQUALITIES | | | | | | | |
| 1. Compare two whole numbers by | | | | | | | |
| Identifying number "less than" or "greater than" a specified number | | | | | | | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 1

| | UNIT PAGES | 8 199-222 | 9 223-234 | 10 235-258 | 11 259-268 | 12 269-288 | 13 289-296 |
|---|---|---|---|---|---|---|---|
| | Using symbols <, >, = | 205,216,217, 221-222(10) | | | 267(6) | | |
| | Completing an inequality statement with a number | | | | | | |
| | Comparing unequal sets | | | | | | |
| 2. | Compare money values by indicating more or less | | | | | | |
| VI. | NOTATION | | | | | | |
| 1. | Recognize digits 1-9 | | | | | | |
| 2. | Write numerals 1-9 | | | | | | |
| 3. | Write two digit numerals from an expanded place value notation | | | | | | |
| 4. | Write two digit numerals as expanded notation sums | | | 241-242(10)/ CT(2) | | | |
| 5. | Recognize and interpret symbols <, > | | | | | | |
| | + | | | | 268(4) | | |
| | - | | | | 268(4) | | |
| | c | | | | | | |
| | () | | 227-234(10)/ CT(2) | | | | |
| 6. | Use vertical algorithm in simple computations | | | | | | |
| | Addition | | | | | | |
| | Subtraction | | | | | | |
| VII. | NUMBER FACTS | | | | | | |
| 1. | Recall addition and subtraction facts by providing answers for simple problems | | | | | | |
| | Sums through 9 | 199-222(10) | | | | | |

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GRADE 1



| UNIT<br>PAGES | 8<br>199-222 | 9<br>223-234 | 10<br>235-258 | 11<br>259-268 | 12<br>269-288 | 13<br>289-296 | |
|---|---|---|---|---|---|---|---|
| Sums of 10 | 199-201,203-205,208-210 (10)/CT(9) | | 235-238(10) | | | | |
| Sums through 18 | | | 243-258(10)/CT(6) | 259-266(10)/CT(9) | | | |
| VIII. EQUATIONS AND SOLUTIONS<br>Interpret equations using ☐ notation (Introduction)<br>Addition<br>Subtraction | | | | | | | |
| IX. NUMBER LINE<br>1. Illustrate order of whole numbers on the number line | | | | | | | |
| 2. Recognize operations represented on the number line<br>Addition | 201(2)/CT(1) | | 251-252(8)/CT(1) | | | | |
| Subtraction | 211(2) | | | | | | |
| X. BASIC PRINCIPLES<br>1. Recognize and use basic principles for addition and subtraction operations<br>Commutative principle | | 223-226(10)/CT(3) | | | | | |
| Associative principle | | 231-234(10)/CT(5) | | | | | |
| Zero principle<br>Use of parentheses (grouping) | | 227-230(10)/CT(2) | | | | | |
| XI. PROCESSES (ALGORITHMS)<br>In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |

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|---|---|---|---|---|---|---|---|
| XII. RATIONAL NUMBERS | | | | | | | |
| 1. Recognize fractions as descriptors of relationships between equivalent subsets and subregions | | | | | | | |
| 1/2 | | | | | 277-278(8)/ CT(1) | | |
| 1/3 | | | | | 279-280(8)/ CT(1) | | |
| XIII. RATIO AND PROPORTION | | | | | | | |
| In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | |
| 1. Solve simple word-picture problems involving | | | | | | | |
| Number of pennies in a set | | | | | | | |
| Total value of a group of pennies, nickles and dimes | | | | | 273-276(10)/ CT(2) | | |
| Addition using nickles and pennies | | | 257(4) | | | | |
| Subtraction using nickles and pennies | 220(4) | | | | | | |
| Adding costs of objects | 219(4)/CT(1) | | 258(4)/ CT(1) | | | | |
| Making change | | | | 265-266(7)/ CT(1) | | | |
| XV. LOGIC | | | | | | | |
| 1. Use informal logic in reasoning with | | | | | | | |
| Addition and subtraction-inverse relationship | | | | | | | |

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GRADE 1



| UNIT<br>PAGES | 8<br>199-222 | 9<br>223-234 | 10<br>235-258 | 11<br>259-268 | 12<br>269-288 | 13<br>289-296 | |
|---|---|---|---|---|---|---|---|
| Sums greater than 10 | | | 253-254(10)/ CT(1) | | | | |
| Subtraction | | | | 261-262(10)/ CT(5) | | | |
| XVI. NUMBER THEORY | | | | | | | |
| 1. Recognize and complete number sequences | | | | | | | |
| Odd number sequence | | | | | 269-270(5)/ CT(1) | | |
| Even number sequence | | | | | 269-270, 272(6)/CT(1) | | |
| Counting by 3's | | | | | 271-272(2) | | |
| Counting by 4's | | | | | 272(1) | | |
| Counting by 5's | | | | | 271-273(6)/ CT(1) | | |
| Counting by 10's | | | | | 274(4) | | |
| XVII. ESTIMATION | | | | | | | |
| In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XVIII. MEASUREMENT | | | | | | | |
| 1. Recognize and use systems for linear measure | | | | | | | |
| Unit of length comparisons | | | | | 281-282(10) | | |
| Inch | | | | | 283-284(8)/ CT(1) | | |
| Centimeter | | | | | 283-284(8)/ CT(1) | | |
| 2. Recognize and use systems for capacity measure | | | | | | | |
| Cup | | | | | 285-286(10)/ CT(1) | | |

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| UNIT<br>PAGES | 8<br>199-222 | 9<br>223-234 | 10<br>235-258 | 11<br>259-268 | 12<br>269-288 | 13<br>289-296 | |
|---|---|---|---|---|---|---|---|
| Pint<br>Quart | | | | | 285-286 (10)<br>285-286 (10) /<br>CT(1) | | |
| XIX. GEOMETRY<br>1. Recognize and discriminate various geometric figures<br>Triangle<br>Square<br>Circle<br>Rectangle | | | | | | 289-296 (9)<br>291-294 (4)<br>293-296 (4)<br>295-296 (3) | |
| XX. GRAPHS AND SCALE DRAWINGS<br>In Grade 1 no outcomes for this topic are described in the Scope and Sequence | | | | | | | |
| XXI. SPECIAL TOPICS<br>1. Tell time by indicating the correct time on a clock-face model<br>To the hour<br>To the half-hour | | | | | | | |
| CUMULATIVE REVIEWS<br>("Looking Back") | 221-222 (10) | | | 267-268 (10) | 287-288 (10) | | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 2



| UNIT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| PAGES | 1-6 | 7-30 | 31-52 | 53-70 | 71-96 | 97-140 | 141-178 | 179-198 |
| I. SET CONCEPTS | | | | | | | | |
| 1. Compare sets | | | | | | | | |
| Equivalent | 1(6) / CT(1) | | | | | | | |
| Non-equivalent | 2(6)/CT(1) | | | | | | | 198(4) |
| 2. Recognize and relate concepts of set, number, numeral | | | | | | | | |
| Sets less than 10 | 3-5(10)/ CT(2) | | | | | | | |
| Sets of 10 | | 7(7)/CT(4) | | | | | | |
| 3. Relate operations on whole numbers to sets | | | | | | | | |
| Addition-joining | | | 31-2,35,37 (10)/CT(1) | | | | | |
| Subtraction-comparing | | | 45-6(6)/ CT(1) | | | | | |
| Subtraction-separating | | | 39-40,43 (10)/CT(1) | | | | | |
| Multiplication-joining | | | | | | | | |
| Multiplication-pairing | | | | | | | | |
| Division-separating | | | | | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Recognize names and place values for whole numbers | | | | | | | | |
| Concept of ten | | 7-12(10)/ CT(2) | | | | | | |
| Concept of hundred | | 23-4(2)/ CT(2) | | | | | | |
| Concept of thousand | | | | | | | | 189-90,193-4/CT(1) |
| 2-3 digit numerals | | 7-30(10)/ CT(8) | | | | | 155(3) | CT(2) |
| 3-4 digit numerals | | 28-9(10) | | | | | | 179-99(10)/ CT(2) |
| 2. Associate numerals and place value with structured groups of objects | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2 digits | | 8-10(10)/ CT(2) | | | 75(10) | | | |
| 3-digits | | 27-30(10) CT(2) | | | | | | 180-88(10) |
| 4-digits | | | | | | | | 182,189-98(10) |
| 3. Relate place value and money | | | | | | | | |
| Pennies | | 12(4)/CT(1) | | | | 131(4) | | |
| Nickles | | | | | | 131(2) | | |
| Dimes | | 12(6)/CT(1) | | | | 131(2) | | |
| Quarters | | | | | | | | |
| Half-dollars | | | | | | 131(4) | | |
| III. OPERATIONS | | | | | | | | |
| 1. Add whole numbers | (See VII-Number Facts and XI-Processes (Algorithms)) | | | | | | | |
| 2. Subtract whole numbers | (See VII-Number Facts and XI-Processes (Algorithms)) | | | | | | | |
| 3. Recognize inverse relationship between addition and subtraction | | | 47-50(10)/ CT(1) | | | 98(8)/CT(1) | | |
| 4. Identify relationship between multiplication and | | | | | | | | |
| Repeated addition | | | | | | | | |
| Arrays | | | | | | | | |
| 5. Divide whole numbers by partitioning sets | | | | | | | | |
| IV. SEQUENCES | | | | | | | | |
| 1. Place numerals in counting sequence | | | | | | | | |
| Within a decade | | 13(7)/CT(1) | | | | | | |
| To one-hundred | | 14-16,21-2, 25-6(10) | | | | | | |
| Above one-hundred | | 30(3) | | | | | | 181(5)/CT(2) |
| To one-thousand | | | | | | | | 182-4,190, 192(10) |
| 2. Place numerals in skip-counting sequence | | | | | | | | |
| By 10 | | | | | | | | |
| By 100, 1000 | | | | | | | | |
| By 3, 4, 5 | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| V. INEQUALITIES | | | | | | | | |
| 1. Compare two whole numbers using <,> or by identifying larger or smaller number | | | | | | | | |
| Ones and decades | 6(6)/CT(2) | 17,19-20 (10)CT(2) | | | | | | 185(10) |
| Within a decade | | 18(10) | | | | | | |
| Hundreds | | | | | | | | 185-8(10)/ CT(2) |
| Thousands | | | | | | | | 195-6(10)/ CT(1) |
| VI. NOTATION | | | | | | | | |
| 1. Identify and interpret symbols | | | | | | | | |
| Write arabic numerals 0-9 | 3-5(10)/ CT(2) | | | | | | | |
| Roman numerals | | | | | | 137-8(10) | | |
| Symbols for fractions | (See XII-Rational Numbers) | | | | | | | |
| 2. Identify terms and symbols related to mathematical operations | | | | | | | | |
| + | | | | 75(10) | | | | |
| - | | | | | | | | |
| x | | | | | | | | |
| ÷ | | | | | | | | |
| () | | | | 71-4,81(10) | | | 142(10) | |
| "Vertical form" (addition) | | | | 53,66(10) | 79(10) | | | |
| "Expanded notation" | | | | | 75(10) | | CT(1) | |
| VII. NUMBER FACTS | | | | | | | | |
| 1. Recognize and recall: Sums and differences less than or equal to 10 | | | 31-52(10)/ CT (4) | 53-70(10)/ CT(2) | 80(7) | | | |
| Sums and differences 11-18 | | | | 54(10) | 81-94(10) | 97,123(10)/ CT(1) | | |
| Products with factors 0-5 | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. Recognize families of facts<br>Addition-subtraction | | | | 52(8)/CT(1) | | 103(5) | | |
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | | |
| 1. Write solution to:<br>Addition equations | | | 31-2,35,37<br>(10)/CT(5) | | | | | |
| --Missing addend | | | | 59-61,63-4<br>(10)/CT(3) | CT(3) | 99-102(10) | | |
| Subtraction equations | | | 39-40,43<br>(10)/CT(4) | | | | | |
| --Missing addend | | | | 63-4(10)/<br>CT(3) | | 99,101-2<br>(10) | | |
| Multiplication equations | | | | | | | | |
| Equations involving parentheses | (See VI-2) | | | | | | | |
| IX. NUMBER LINE | | | | | | | | |
| 1. Represent order of whole numbers | 6(1)/CT(2) | | | | | | | |
| 2. Represent operations<br>Addition | | 33-4,36<br>(10)/CT(1) | | | 89(4)/CT(1) | | | |
| --Missing addends | | | | 60(4) | 90(4) | 100(4) | | |
| --Rearranging addends | | | | | | | 146(4) | |
| Subtraction | | | 41-2,44(10) | CT(1) | | 107(2)/<br>CT(1) | | |
| Multiplication | | | | | | | | |
| 3. Write addition-subtraction equations using the number line | | | | | | 109(4) | | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize and use basic principles for operations | | | | | | | | |
| Associativity (addition) | | | | | 73-4,81(8) | | 142(7) | |
| Commutativity (addition) | | | 51(4) | | | | | |
| Commutativity (multiplication | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Identity elements (addition-multiplication)<br>Rearranging addends | | | | | | | 143-6,148 (10) | |
| XI. PROCESSES (ALGORITHMS)<br>1. Use algorithms for addition<br>2-digit numerals-sums less than 100<br>--Without regrouping<br>--With regrouping<br>2-digit multiples of 10<br>3-4 digit numerals<br>--Without regrouping<br>Column addition | | | | | 81-88,91-2 (10)/CT(3) | 97,123(10) | 148-64,176 (10)/CT(4)<br>155-6(10)/ CT(1) | |
| 2. Use algorithum for subtraction<br>2-digit numerals<br>--Without regrouping<br>--Readiness for regrouping<br>--With regrouping<br>2-digit multiples of 10<br>3-4 digit numerals | | | | | | | 169-70(10)<br>165-6(10) | |
| 3. Use algorithums for multiplication | | | | | | | | |
| 4. Use algorithms for division | | | | | | | | |
| XII. RATIONAL NUMBERS<br>1. Recognize fractions<br>1/2<br>1/3<br>1/4<br>1/5 | | | | | | | | |
| XIII. RATIO-PROPORTION | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XIV. PROBLEM SOLVING | | | | | | | | |
| 1. Sove reasoning problems using | | | | | | | | |
| Addition | | | 53(10) | | 91(5) | | | |
| Subtraction | | | 69(3) | | | 105-6,117 (10) | 65(6) | |
| Multiplication | | | | | | | | |
| Inequalities | | | | | | | | 185(10) |
| Money | | | | | | 132(4) | | |
| 2. Solve word problems with | | | | | | | | |
| Addition | | | | 55(4)/CT(1) | | CT(1) | 154,161,163 (10)/CT(2) | |
| Subtraction | | | | 67(3)/CT(1) | | 113(3)/ CT(1) | 171(4) | |
| Multiplication | | | | | | | | |
| Inequalities | | | | | | | | 197(4) |
| Money | | | 38(6)/CT(1) | CT(2) | | 123,125,127 (10) | | |
| Liquid Measure | | | | | | | | |
| Varied Applications | | | | 67,69(4) | | 111,119, 125,129(10) | 173,175(7) | |
| XV. LOGIC | | | | | | | | |
| 1. Use informal logic in developing concepts of computation and problem solving | | | 53(2) | | 91(5)/CT(1) | 105(2) | 165(2) | 185(8) |
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Identify properties of special sets of whole numbers | | | | | | | | |
| Odd and even numbers | | | | | | | | |
| Sums of odd and even numbers | | | | | | | | |
| XVII. ESTIMATION | | | | | | | | |
| 1. Compare sum or difference of tens with a given numeral (readiness for regrouping) | (See XI) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XVIII. MEASUREMENT | | | | | | | | |
| 1. Recognize and use systems for linear measurement | | | | | | | | |
| Inches | | | | | | | | |
| Centimeters | | | | | | | | |
| Concept of length (general units) | | | | | | | | |
| 2. Recognize and use systems for measure of volume | | | | | | | | |
| Cups | | | | | | | | |
| Gallons | | | | | | | | |
| Pints | | | | | | | | |
| Quarts | | | | | | | | |
| 3. Recognize and use system for measure of time | | | | | | | | |
| Half-hour intervals | | | | | | 133-4(10) | | |
| 5-minute intervals | | | | | | 135-6(10) | | |
| XIX. GEOMETRY | | | | | | | | |
| 1. Identify and construct basic figures | | | | | | | | |
| Line segments | | | | | | | | |
| Triangles | | | | | | | | |
| Circles | | | | | | | | |
| Squares | | | | | | | | |
| Rectangles | | | | | | | | |
| 2. Identify congruent shapes | | | | | | | | |
| 3. Identify similar shapes | | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | | |
| 1. Read maps in solving word problems | | | | | | | | |
| 2. Use charts to solve computation problems | | | | | | | | |
| XXI. SPECIAL TOPICS | | | | | | | | |
| 1. Tell time | (See XVIII) | | | | | | | |
| 2. Identify and interpret Roman numerals | (See VI-I) | | | | | | | |
| CUMULATIVE REVIEWS ("Keeping in Touch") | | | | | | 139-40(10) | 177-78(10) | |

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|---|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | | |
| 1. Compare sets | | | | | | | | |
| Equivalent | | | | | | | | |
| Non-equivalent | | | | | | | | |
| 2. Recognize and relate concepts of set, number, numeral | | | | | | | | |
| Sets less than 10 | | | | | | | | |
| Sets of 10 | | | | | | | | |
| 3. Relate operations on whole numbers to sets | | | | | | | | |
| Addition-joining | | | | | | | | |
| Subtraction-comparing | | | | | | | | |
| Subtraction-separating | | | | | | | | |
| Multiplication-joining | | | | | 247-53(10)/ CT(4) | | | |
| Multiplication-pairing | | | | | 261-64(10)/ CT(1) | | | |
| Division-separating | | | | | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Recognize names and place values for whole numbers | | | | | | | | |
| Concept of ten | | | | | | | | |
| Concept of hundred | | | | | | | | |
| Concept of thousand | | | | | | | | |
| 2-3 digit numerals | | | | | | | | |
| 3-4 digit numerals | 202(10) | | | | | | | |
| 2. Associate numerals and place value with structured groups of objects | | | | | | | | |
| 2-digits | | | 223-4(10)/ CT(2) | | | | | |
| 3-digits | | | | | | | | |
| 4-digits | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 3. Relate place value and money | | | | | | | | |
| Pennies | | | | | | 269(10)/ CT(1) | | |
| Nickles | | | | | | 269(10)/ CT(2) | | |
| Dimes | | | | | | 269(10)/ CT(2) | | |
| Quarters | | | | | | CT(2) | | |
| Half-dollars | | | | | | 271(3)/ CT(2) | | |
| III. OPERATIONS | | | | | | | | |
| 1. Add whole numbers | (See VII-Number Facts and XI-Processes (Algorithms)) | | | | | | | |
| 2. Subtract whole numbers | (See VII-Number Facts and XI-Processes (Algorithms)) | | | | | | | |
| 3. Recognize inverse relationship between addition and subtraction | | | | | | | | |
| 4. Identify relationship between multiplication and | | | | | | | | |
| Repeated addition | | | | | 253-4,256 (10)/CT(1) | | | |
| Arrays | | | | | 257(10)/ CT(3) | | | |
| 5. Divide whole numbers by partitioning sets | | | | | 267-8(8)/ CT(1) | | | |
| IV. SEQUENCES | | | | | | | | |
| 1. Place numerals in counting sequence | | | | | | | | |
| Within a decade | | | | | | | | |
| To one-hundred | | | | | | | | |
| Above one-hundred | | | | | | | | |
| To one thousand | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. Place numerals in skip-counting sequence | | | | | | | | |
| By 10 | 199(1) | | | 246(1)/ CT(2) | | | | |
| By 100, 1000 | 199(2) | | | | | | | |
| By 3, 4, 5 | | | | 245-6(2)/ CT(2) | | | | |
| V. INEQUALITIES | | | | | | | | |
| 1. Compare two whole numbers using <, > or by identifying larger or smaller number | | | | | | | | |
| Ones and decades | | | | | | | | |
| Within a decade | | | | | | | | |
| Hundreds | | | | | | | | |
| Thousands | | | | | | | | |
| VI. NOTATION | | | | | | | | |
| 1. Identify and interpret symbols | | | | | | | | |
| Write arabic numerals 0-9 | | | | | | | | |
| Roman numerals | | | | | | | | |
| Symbols for fractions | | | | | | | | |
| 2. Identify terms and symbols related to mathematical operations | | | | | | | | |
| + | | | | | | | | |
| - | | | | | | | | |
| x | | | | | 249-66(10)/ CT(4) | | | |
| ÷ | | | | | 267-8(8)/ CT(1) | | | |
| () | | | | | | | | |
| "Vertical form" (addition) | | | | | | | | |
| "Expanded notation" | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| VII. NUMBER FACTS | | | | | | | | |
| 1. Recognize and recall:<br>Sums and differences less than or equal to 10<br>Sums and differences 11-18<br>Products with factors 0-5 | | | | | 247-66(10)/<br>CT(9) | | | |
| 2. Recognize families of facts<br>Addition-subtraction | (See III-2) | | | | | | | |
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | | |
| 1. Write solution to:<br>Addition equations<br>--Missing addend<br>Subtraction equations<br>--Missing addend<br><br>Equations involving parentheses | | | | | 249(2)/<br>CT(4) | | | |
| IX NUMBER LINE | | | | | | | | |
| 1. Represent order of whole numbers | | | | | | | | |
| 2. Represent operations<br>Addition | CT(1) | | | | | | | |
| --Missing addends<br>--Rearranging addends<br>Subtraction<br>Multiplication | | | | | 254-5(4)/<br>CT(1) | | | |
| 3. Write addition-subtraction equations using the number line | | | | | | | | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize and use basic principles for operations | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Associativity (addition) | | | | | | | | |
| Commutativity (addition) | | | | | | | | |
| Commutativity (multiplication) | | | | | 247-8,252-3 (10) | | | |
| Identity elements (addition-multiplication) | | | | | 252(4) | | | |
| Rearranging addends | | | | | | | | |
| XI. PROCESSES (ALGORITHMS) | | | | | | | | |
| 1. Use algorithms for addition | | | | | | | | |
| 2-digit numerals-sums less than 100 | | V | | | | | | |
| --Without regrouping | | CT(1) | | | | | | |
| --With regrouping | 200(2) | 211-20(10)/ CT(8) | | | | 269(10) | | |
| 2-digit multiples of 10 | | | | | | | | |
| 3-4 digit numerals | | | | | | | | |
| --Without regrouping | 200,204(10)/ CT(2) | | | | | | | |
| Column addition | 203(5) | | | | | | | |
| 2. Use algorithm for subtraction | | | | | | | | |
| 2-digit numerals | | | | | | | | |
| --Without regrouping | | | | | | | | |
| --Readiness for regrouping | | 209-11(10) | 221-2(10)/ CT(2) | | | | | |
| --With regrouping | | | 221-36(10)/ CT(2) | | | | | |
| 2-digit multiples of 10 | | | | | | | | |
| 3-4 digit numerals | 204-5(10) CT(2) | | | | | | | |
| 3. Use algorithms for multiplication | | | | | 249(2)/ CT(2) | | | |
| 4. Use algorithms for division | | | | | 267-8(8)/ CT(1) | | | |

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|---|---|---|---|---|---|---|---|---|
| XII. RATIONAL NUMBERS | | | | | | | | |
| 1. Recognize fractions | | | | | | | | |
| 1/2 | | | | | | 275,279(5) | | |
| 1/3 | | | | | | 276,279,280 (9) | | |
| 1/4 | | | | | | 277,280(6) | | |
| 1/5 | | | | | | 278(4) | | |
| XIII. RATIO-PROPORTION | | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | | |
| 1. Solve reasoning problems using | | | | | | | | |
| Addition | 202(10) | 210(10)/ CT(2) | | | | | | |
| Subtraction | | | | | | | | |
| Multiplication | | | | | | | | |
| Inequalities | | 209(10)/ CT(1) | | | | | | |
| Money | | | 237(6)/ CT(1) | | | | | |
| 2. Solve word problems with Addition | 207(7)/ CT(1) | 207,217,219 (10)/CT(2) | | | | | | |
| Subtraction | | | 231,233,235 (10)/CT(1) | | | | | |
| Multiplication | | | | | 250,262,265 -6(10)/ CT(1) | | | |
| Inequalities | | | | | | | | |
| Money | | | | | | 271(4)/ CT(1) | | |
| Liquid Measure | | | | | | 286(4)/ CT(1) | | |
| Varied Applications | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XV. LOGIC | | | | | | | | |
| 1. Use informal logic in developing concepts of computation and problem solving | | | 237(3)/<br>CT(1) | | | | | |
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Identify properties of special sets of whole numbers | | | | | | | | |
| Odd and even numbers | | | | 241-4(10)/<br>CT(6) | | | | |
| Sums of odd and even numbers | | | | 243-4(8)/<br>CT(1) | | | | |
| XVII. ESTIMATION | | | | | | | | |
| 1. Compare sum or difference of tens with a given numeral (readiness for regrouping) | | | | | | | | |
| XVIII. MEASUREMENT | | | | | | | | |
| 1. Recognize and use systems for linear measurement | | | | | | | | |
| Inches | | | | | | 282-4(10)/<br>CT(1) | | |
| Centimeters | | | | | | 282-4(10)/<br>CT(1) | | |
| Concept of length (general units) | | | | | | 281(9) | | |
| 2. Recognize and use systems for measure of volume | | | | | | | | |
| Cups | | | | | | 285(3) | | |
| Gallons | | | | | | 285(2)/<br>CT(1) | | |
| Pints | | | | | | 285(5) | | |
| Quarts | | | | | | 285(4)/<br>CT(1) | | |

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|---|---|---|---|---|---|---|---|---|
| 3. Recognize and use system for mesure of time | | | | | | | | |
| Half-hour intervals | | | | | | | | |
| 5-minute intervals | | | | | | | | |
| XIX. GEOMETRY | | | | | | | | |
| 1. Identify and construct basic figures | | | | | | | | |
| Line segments | | | | | | | 291-2(10) | |
| Triangles | | | | | | | 289-90(3) | |
| Circles | | | | | | | 289(1) | |
| Squares | | | | | | | 289-90(2) | |
| Rectangles | | | | | | | 289-90(3) | |
| 2. Identify congruent shapes | | | | | | | 293-5(10) | |
| 3. Identify similar shapes | | | | | | | 296(4) | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | | |
| 1. Read maps in solving word problems | 207(1) | | | | | | | |
| 2. Use charts to solve computation problems | | | | | 257,263-4 (10) | | | |
| XXI. SPECIAL TOPICS | | | | | | | | |
| 1. Tell time | | | | | | | | |
| 2. Identify and interpret Roman numerals | | | | | | | | |
| CUMULATIVE REVIEWS ("Looking Back") | | | 239-240(10) | | | | | |

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|---|---|---|---|---|---|---|---|---|
| PAGES | 1-19 | 20-43 | 44-51 | 52-83 | 84-127 | 128-135 | 136-163 | 164-189 |
| I. SET CONCEPTS | | | | | | | | |
| 1. Recognize and relate concepts of set, number, numeral | 1(10) | | | | | | | |
| 2. Identify operations on sets | | | | | | | | |
| Intersection | | | | | | | 156(0) | |
| Product set | | | | | 120-3(6) | | | |
| 3. Relate operations on whole numbers to sets | | | | | | | | |
| Subtraction-comparing | | 28-9(10)/CT(2) | | | | | | |
| Multiplication-joining | | | | | 84-5(10) 30(4)/CT(1) | | | |
| Multiplication-pairing | | | | | 120-3(6) 42(3)/CT(1) | | | |
| Division-separating | | | | | | | 136-8,149, 154-5,158 (10) 44,51 (10)/CT(5) | |
| Addition-joining | 8(2)/CT(2) | | | | | | | |
| Subtraction-separating | 8(2) | | | | | | | |
| 4. Relate sets and subsets to fractional numbers | | | | | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Recognize names and place values for whole numbers | | | | | | | | |
| Concept of digit | 2(0),1(7) | | | | | | | |
| 2 - digit numerals | 2-6,8(10) 1,2(10)/CT(2) | | | | | | | |

[c]Numerals that are underlined refer to pages and corresponding numbers of items (to 10) in the student workbook.

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|---|---|---|---|---|---|---|---|---|
| 3 and 4 digit numerals | 7-17(10)2, 3,6(10)/CT (10) | | | | | | | |
| 5 and 6 digit numerals | 14-18(10) | | | | | | | |
| Millions | 18(5) | | | | | | | |
| 2. Associate numerals and place values with structured groups of objects | | | | | | | | |
| Grouped by tens | 2-4(10)1(8) /CT(1) | | | | | | | |
| Grouped by hundreds | 6-9(7)2,3 (9) | | | | | | | |
| Regrouping with 2-digit numerals | | | | 72(10)25 (10)/CT(2) | | | | |
| Related to money: pennies and dimes | 5(6) | | | 52-3(10) | | | | |
| III. OPERATIONS | (See also XI-Processes (Algorithms)) | | | | | | | |
| 1. Add whole numbers involving sums of 10, 20, 30, 40, ... | | | | 54-5(10)18-19(10) | | | | |
| 2. Recognize inverse relationship between | | | | | | | | |
| Addition and subtraction | | 20-1,26(10) 12(10) | | | | | | |
| Multiplication and division | | | | | | | 144-5,149, 152,156(10) 49,53(10)/ CT(6) | |
| 3. Identify relationship between | | | | | | | | |
| Multiplication and repeated addition | | | | | 86-7(10)/ CT(3) | | | |
| Division and repeated subtraction | | | | | | | 140-1,148 (10)46(4)/ CT(2) | |

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|---|---|---|---|---|---|---|---|---|
| 4. Multiply whole numbers By factors of 10 and 100 By factors of 20, 30, 40,.. | | | | | | | | |
| 5. Identify related products (3 x 4, 3 x 40, 3 x 400, etc.) | | | | | | | | |
| 6. Divide with whole numbers: Quotients with zero endings | | | | | | | | |
| 7. Add three or more numbers | | 31(10)11 (10)/CT(3) | | | | | | |
| IV. SEQUENCES | | | | | | | | |
| 1. Place numberals in counting sequence | | | | | | | | |
| 2-digit numerals | 4-5(10)4 (7) | | | | | | | |
| 3 and 4 digit numerals | 8(10)4,6 (10) | | | | | | | |
| Odd and even numbers | (See XVI-Number Theory) | | | | | | | |
| 2. Relate place value and counting | 4,8(10) 4,6(10)/CT (3) | | | | | | | |
| V. INEQUALITIES | | | | | | | | |
| 1. Compare two whole numbers using <, > or by designating larger, or smaller of given numbers | 12-3(10) 5,6(10)/CT (4) | | | 22(10)/CT (1) | CT(4) | | CT(1) | |
| 2. Use inequalities intuitively in computing approximations based on logical reasoning | | | | 22(10) | | | | |
| VI. NOTATION | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 1. Identify terms related to mathematical operations* | | | | | | | | |
| Addend and sum | | 24-5(10)/CT(2) | | | | | | |
| Factor and product | | | | | 92(10)/CT(2) | | | |
| Quotient | | | | | | | 137(3) | |
| 2. Recognize and interpret* symbols | | | | | | | | |
| : | | | | | | | 136(5) | |
| Variable (n) | | 24-5(10) | | | | | | |
| $\sqrt{\ }$ | | | | 78(10) | | | | |
| VII. NUMBER FACTS | | | | | | | | |
| 1. Recognize and recall sums (Addition-subtraction facts)* | | | | | | | | |
| Sums to 9 | | 24-7(10) | | | | | | |
| Sums of 10-19 | | 33-7(10)<br>11,13(10) | | | | | | |
| 2. Recognize and recall products for factors | | | | | 106-15(10)<br>35-8(10)/CT(3) | | | |
| 0 - 9 (multiplication facts) | | | | | | | | |
| 3. Recognize and recall division facts | | | | | | | 138,152,156(10)/CT(1) | |
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | | |
| 1. Determine solutions to addition and subtraction equations* | | 20-8,36-7(10)<br>8(10)/CT(3) | | CT(1) | | | | |

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|---|---|---|---|---|---|---|---|---|
| Multiplication equations* | | | | | 87(10)/CT(1) | | | |
| Division equations* | | | | | | | 144-5(10) CT(1) | |
| 2. Write equation to describe pictured operation on sets | | 20-1(10) | | | | | | |
| IX. NUMBER LINE | | | | | | | | |
| 1. Represent operations on the number line | | | | | | | | |
| Addition and subtraction | | 22-3(10)9(6)/CT(1) | | | | | | |
| Multiplication | | | | | 88-9(10)31(2)/CT(1) | | | |
| Division | | | | | | | 142,158(9) 47(6) | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize and use basic principles for addition and subtraction operations | | | | | | | | |
| Commutative principle (addition) | | 30(10)10(10) | | | | | | |
| Associative principle and use of parentheses (addition) | | 31(10)11(10)/CT(3) | | | | | | |
| Rearranging addends | | 32-3(6) | | | | | | |
| Grouping addends (sums of 10) | | 33(0) | | | | | | |
| Grouping addends (sums between 10 and 19) | | 34(10)11(10) | | | | | | |
| 2. Recognize and use basic principles for multiplication and division operations | | | | | | | | |
| Commutative principle (multiplication) | | | | | 98-9(10)32(8)/CT(1) | | | |

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|---|---|---|---|---|---|---|---|---|
| Associative principle and use of parentheses (multiplication) | | | | | 100(8)32(8) | | | |
| Rearranging factors | | | | | 101(10) | | | |
| Addition-multiplication principle | | | | | 102-5(10)<br>33-4(10)/CT(1) | | | |
| Zero in multiplication | | | | | 97(10)32(2)/CT(1) | | | |
| One in multiplication | | | | | 96(10)/CT(1) | | | |
| Zero in division | | | | | | | 146(10)50(6)/CT(2) | |
| One in division | | | | | | | 147(10)50(6) | |
| XI. PROCESSES (ALGORITHMS) | | | | | | | | |
| 1. Use algorithm for addition of whole numbers | | | | | | | | |
| Addition: 2 and 3 digit numerals | | | | | | | | |
| --No renaming | | | | 56-8(10)/CT(2) | | | | |
| --Renaming | | | | 68-9(10)22-4,28(10)/CT(1) | | | | |
| 2. Use algorithm for subtraction on whole numbers | | | | | | | | |
| Subtraction: 2-digit (no renaming) | | | | 60-3,71(10) | | | | |
| : 2-digit (renaming) | | | | 73(10)26-8(10)/CT(1) | | | | |
| : 3-digit (no renaming) | | | | 63(10)20(10)/CT(2) | | | | |
| 3. Use algorithm for multiplication on whole numbers | | | | | | | | |
| One 2-digit factor | | | | | | | | |
| One 3-digit factor | | | | | | | | |
| One factor 4 or more digits | | | | | | | | |
| Two 2-digit factors | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 4. Use algorithm for division<br>Relating division to subtraction of multiples of divisor<br>Remainders in division<br>Checking division<br>Regular algorithm-single-digit divisor and 2-digit quotient | | | | | | | | |
| XII. RATIONAL NUMBERS | | | | | | | | |
| 1. Recognize fractions as descriptors of part-whole relationship<br>1/2<br>1/3<br>1/4<br>1/5<br>1/6<br>1/8<br>Equivalent fractions<br>Numerators greater than one | | | | | | | | |
| 2. Relate fractions to concept of number pair | | | | | | | | |
| 3. Order of rational numbers | | | | | | | | |
| XIII. RATIO AND PROPORTION | | | | | | | | |
| XIV. PROBLEM SOLVING** | | | | | | | | |
| 1. Solve verbal problems involving special topics | | | | | | | | |
| Travel (odometer) | 15(4) 6(4) | | | | | | | |
| Science | | | | 64(6) | | | | |
| Games (scoring) | | | | | 93(5) | | | |
| Shopping | | | | 65(7) | | | | 185(5) |
| Speed | | | | | | | | |
| Space travel | | | | | | | | |
| Time | | | | | | | | |

** There is no explicit sequence for developing skills in this domain. Verbal problems occur in all chapters. The entries here are illustrative and not exhaustive.

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|---|---|---|---|---|---|---|---|---|
| 2. Solve problems embedded in short stories | | | | | | | | |
| Addition and subtraction | | 29,38(10) 6(10)/CT (2) | | 53,59,65,70, 79,83(10)21, 28(10)/CT(2) | | | 54(5) | |
| Multiplication | | | | | 90-1,93,116-7,119(10)41 (10)/CT(3) | | 54(3) | |
| --and pairing | | | | | 122-3(5) | | | |
| Division | | | | | | | 139,143,157, 159(10)45, 54(10)/CT (3) | |
| 3. Solve verbal problems involving fractions | | | | | | | | |
| 4. Solve problems involving money recognition and values | | | | | 90-1(10) | | | |
| Pennies | 5(5) | | | 52-3,76-7 (10)/CT(1) | | | | |
| Nickels | | | | 76-7(5)/ CT(1) | | | | |
| Dimes | 5(6) | | | 52-3,76-7 (9)/CT(1) | | | | |
| Quarters | | | | 76-7(1)/ CT(1) | | | | |
| Half dollars | | | | 76-7(1)/ CT(1) | | | | |
| Dollars and cents | | | | 78(10)28 (10)/CT(2) | | | | |
| XV. LOGIC | | | | | | | | |
| 1. Use informal logic in computation | | | | | | | | |
| Reasoning in subtraction | | | | 71(10)20 (10) | | | | |
| Reasoning in addition | | | | 18,19(10)/ CT(1) | | | | |
| Reasoning in division | | | | | | | 52(10) | |

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|---|---|---|---|---|---|---|---|---|
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Recognize properties of special sets of whole numbers | | | | | | | | |
| Odd and even numbers | | | | | | | | |
| Odd-even sums and products | | | | | | | | |
| Factors and multiples | | | | | | | | |
| Prime numbers | | | | | | | | |
| XVII. ESTIMATION | | | | | | | | |
| 1. Estimate results of mathematical operations | | | | | | | | |
| Products | | | | | | | | |
| 2. Estimate measurements | | | | | | | | |
| Area | | | | | | | | |
| Distance and length | | | | | | | | 181<br>174(4) |
| XVIII. MEASUREMENT | | | | | | | | |
| 1. Recognize and use systems for linear measurement | | | | | | | | |
| Centimeter | | | | | | | | 172-3,177<br>(10)56-7<br>(10)/CT(1) |
| Inch (nearest inch) | | | | | | | | 171,174-5<br>(10)56-7<br>(10)/CT(4) |
| --Half inch (nearest half inch) | | | | | | | | 176,57(8)/<br>CT(1) |
| Foot | | | | | | | | 171(1)56<br>(2)/CT(2) |
| Yard | | | | | | | | 171(1)/CT<br>(1) |
| Mile | 15(0) | | | | | | | 171(1) |
| General units | | | | | | | | 164-71(10)<br>/CT(2) |

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|---|---|---|---|---|---|---|---|---|
| 2. Recognize and use systems for measuring volume | | | | | | | | |
| Cup, pint, quart | | | | | | | | 184-5(10) 60(10)/CT (2) |
| Gallon | | | | | | | | 184-5(7) 60(4)/CT (1) |
| Ounce (liquid) | | | | | | | | 184-5(5) 60(3) |
| General units of volume | | | | | | | | 164-66, 182-3(10)/ CT(1) |
| Cubic inch, centimeter | | | | | | | | 182(0)59 (10) |
| Volume of a cube | | | | | | | | CT(3) |
| Volume of irregular objects | | | | | | | | CT(2) |
| 3. Recognize and use systems for measuring area | | | | | | | | |
| Square unit --General | | | | | | | | 164-7,178-9(10)/CT (1) |
| --Inch, centimeter | | | | | | | | 178(0)58 (10) |
| 4. Determine area (by counting units) | | | | | | | | |
| Rectangle | | | | | | | | 178-9/CT (1) |
| Square | | | | | | | | 178-9(2) |
| Triangle | | | | | | | | 180-1(6) |
| Irregular shapes | | | | | | | | 58(8)/CT (2) |
| 5. Recognize units of time- second, minute, hour, day, week, month | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XIX. GEOMETRY | | | | | | | | |
| 1. Recognize and construct basic figures | | | | | | | | |
| a) Line | | | | | | | | |
| Lines through a common point | | | 44 (1) | | | | | |
| Line through two points | | | 44 (1) | | | | | |
| b) Ray | | | | | | | | |
| Rays from common point | | | 44 (1) | | | | | |
| c) Line segments | | | | | | | | |
| Line segment between two points | | | 44 (1) | | | | | |
| Number of line segments in a figure | | | 44 (3) | | | | | |
| Midpoint of line segment | | | | | | 134 (3) | | |
| d) Angle | | | | | | | | |
| Angles in a triangle | | | 44 (1) | | | | | |
| Right angles | | | 44 (1) | | | | | |
| Right angles in a circle | | | | | | | | |
| 2. Construct geometric shapes and state relationships among various components | | | | | | | | |
| a) Triangle | | | | | | | | |
| Points inside and outside | | | 46 (1) | | | | | |
| Sum of angles in a triangle | | | 47 (2) | | | | | |
| Right triangle | | | | | | | | |
| --Leg, hypotenuse | | | | | | | | |
| --Pythagorean relationship (non-formal) | | | | | | | | |
| b) Quadrilateral | | | 48 | | | | | |
| Points inside and outside | | | 48 (1) | | | | | |
| Triangles in a quadrilateral | | | 48 (1) | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Quadrilaterals in a triangle | | | 48(1) | | | | | |
| Sum of angles in a quadrilateral | | | 49(1) | | | | | |
| c)Polygon | | | 50-1(3) | | | | | |
| Vertices, diagonal | | | 50-1(4) | | | | | |
| Number of diagonals | | | 50-1(4) | | | | | |
| Pentagon (name) | | | 50-1(0) | | | | | |
| Hexagon (name) | | | 50-1(0) | | | | | |
| d)Parallel Lines | | | | | | 128-35(5) | | |
| e)Angles and parallel lines | | | | | | 130-1(6) | | |
| Relationship between angles formed by a transversal | | | | | | 131(3) | | |
| f)Parallelogram | | | | | | 131-5(4) | | |
| Triangles in parallelogram | | | | | | 132-3(3) | | |
| Rhombus | | | | | | | | |
| g)Circle | | | | | | | | |
| Center of a circle | | | | | | | | |
| Right angles inside a circle | | | | | | | | |
| h)Rectangle | | | | | | | | |
| Triangles in a rectangle | | | | | | | | |
| Square | | | | | | | | |
| i)Symmetry | | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | | |
| 1. Recognize and use concepts in coordinate geometry | | | | | | | | |
| Coordinates | | | | | | | | |
| Coordinate axis | | | | | | | | |
| Number pairs (graphing) | | | | | | | | |

LMS MATH

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|---|---|---|---|---|---|---|---|---|
| 2. Develop and interpret simple graphs<br>Graphs of functions<br>Graphs with negative numbers | | | | | | | | |
| 3. Interpret charts and maps | 16-17(10) | | | 65,70,74-5 (10) | | | | |
| XXI. SPECIAL TOPICS<br>1. Recognize concept of a "function machine"<br>Addition and subtraction | | 25,39-41(10<br>14-15(10) | | | 40(6) | | | |
| Multiplication and division<br>Repeated subtraction<br>Even numbers | | | | | 110(10)<br>39-40(10)/ | | 153(10)<br>48(10) | |
| 2. Approximate simple probabilities | | | | | | | | |
| | | | | | | | | |
| CHAPTER REVIEW | 19(10)7 (10) | 43(10)17 (10) | | 82-3(10)29 (10) | 126-7(10)<br>43(10) | | 162(10)<br>55(10) | 188-9(10)<br>61(10) |
| CUMULATIVE REVIEWS ("Keeping in Touch") | | 42(10) | | 66-7,80-1 (10) | 94-5,124-5 (10) | | 150-1,160-1(10)/CT (10) | 186-7(10) |

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|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | |
| 1. Recognize and relate concepts of set, number, numeral | | | | | | | |
| 2. Identify operations on sets<br>Intersection<br>Product set | | | | | | | |
| 3. Relate operations on whole numbers to sets<br>Subtraction-comparing<br>Multiplication-joining<br>Multiplication-pairing<br>Division-separating<br>Addition-joining<br>Subtraction-separating | | | | | 254-5 (2) 78 (1) | | |
| 4. Relate sets and subsets to fractional numbers | | | | | | 286-7 (8) | |
| II. PLACE VALUE | | | | | | | |
| 1. Recognize names and place values for whole numbers<br>Concept of digit<br>2-digit numerals<br>3 and 4 digit numerals<br>5 and 6 digit numerals<br>Millions | | | | | | | |
| 2. Associate numerals and place values with structured groups of objects<br>Grouped by tens<br>Grouped by hundreds<br>Regrouping with 2-digit numerals<br>Related to money: pennies and dimes | | | | | 79 (6) | | |

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|---|---|---|---|---|---|---|---|
| III. OPERATIONS | (See also XI-Processes (Algorithms)) | | | | | | |
| 1. Add whole numbers involving sums of 10, 20, 30, 40,... | | | | | | | |
| 2. Recognize inverse relationship between<br>Addition and subtraction<br>Multiplication and division | | | | | 78,80(10)/CT(2) | | |
| 3. Identify relationship between<br>Multiplication and repeated addition<br>Division and repeated subtraction | | | | | 254-5(4)<br>78,82-3(10)/CT(1) | | |
| 4. Multiply whole numbers<br>By factors of 10 and 100<br>By factors of 20, 30, 40,.. | | | 208-11(10)<br>66(10)/CT(3)<br>212,120(10)<br>67(10)/CT(2) | | 79(10)<br>79(10) | | |
| 5. Identify related products (3 x 4, 3 x 40, 3 x 400, etc.) | | | 213(10) | | 79-80(10) | | |
| 6. Divide with whole numbers<br>Quotients with zero endings | | | | | 256-7(10) | | |
| 7. Add three or more numbers | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
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| **IV. SEQUENCES** | | | | | | | | |
| 1. Place numerals in counting sequence | | | | | | | | |
| 2-digit numerals | | | | | | | | |
| 3 and 4 digit numerals | | | | | | | | |
| Odd and even numbers | (See XVI-Number Theory) | | | | | | | |
| 2. Relate place value and counting | | | | | | | | |
| **V. INEQUALITIES** | | | | | | | | |
| 1. Compare two whole numbers using <, > or by designating larger, or smaller of given numbers | | | | | | | | |
| 2. Use inequalities intuitively in computing approximations based on logical reasoning | | | 239(0) | | | | | |
| **VI. NOTATION** | | | | | | | | |
| 1. Identify terms related to mathematical operations | | | | | | | | |
| Addend and sum | | | | | | | | |
| Factor and product | | | | | | | | |
| Quotient | | | | | | | | |
| 2. Recognize and interpret symbols | | | | | | | | |
| $\div$ | | | | | | | | |
| Variable (n) | | | | | | | | |
| $\sqrt{}$ | | | | | | | | |
| $ | | | | | | | | |
| | | | | | 272(10) | | | |
| **VII. NUMBER FACTS** | | | | | | | | |
| 1. Recognize and recall sums (Addition-subtraction facts) | | | | | | | | |
| Sums to 9 | | | | | | | | |
| Sums of 10-19 | | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 2. Recognize and recall products for factors 0 - 9 (multiplication facts) | | | 230(10) | | | | |
| 3. Recognize and recall division facts | | | | | | | |
| VIII. EQUATIONS AND SOLUTIONS<br>1. Determine solutions to addition and subtraction equations<br>Multiplication equations<br>Division equations<br>2. Write equation to describe pictured operation on sets | | | | | | | |
| IX. NUMBER LINE<br>1. Represent operations on the number line<br>Addition and subtraction<br>Multiplication<br>Division | | | | | 254-5(3)<br>78(1) | | |
| X. BASIC PRINCIPLES<br>1. Recognize and use basic principles for addition and subtraction operations<br>Commutative principle (addition)<br>Associative principle and use of parentheses (addition)<br>Rearranging addends<br>Grouping addends (sums of 10)<br>Grouping addends (sums between 10 and 19) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 2. Recognize and use basic principles for multiplication and division operations | | | | | | | |
| Commutative principle (multiplication) | | | | | | | |
| Associative principle and use of parentheses (multiplication) | | | CT(1) | | | | |
| Rearranging factors | | | | | | | |
| Addition-multiplication | | | 216-21(10)<br>68-9(10)/<br>CT(1) | | | | |
| Zero in multiplication | | | | | | | |
| One in multiplication | | | | | | | |
| Zero in division | | | | | | | |
| One in division | | | | | | | |
| XI. PROCESSES (ALGORITHMS) | | | | | | | |
| 1. Use algorithm for addition of whole numbers | | | | | | | |
| Addition: 2 and 3 digit numerals | | | | | | | |
| --No renaming | | | | | | | |
| --Renaming | | | | | | | |
| 2. Use algorithm for subtraction on whole numbers | | | | | | | |
| Subtraction: 2-digit (no renaming) | | | | | | | |
| : 2-digit (renaming) | | | | | | | |
| : 3-digit (no renaming) | | | | | | | |
| 3. Use algorithm for multiplication on whole numbers | | | | | | | |
| One 2-digit factor | | | 222-6,230-3<br>(10)70-2(10)<br>/CT(2) | | | | |

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|---|---|---|---|---|---|---|---|
| One 3-digit factor | | | 234-7 (10)<br>74 (10)/<br>CT (1) | | | | |
| One factor 4 or more digits | | | 236 (10)<br>74 (5)/CT<br>(1) | | | | |
| Two 2-digit factors | | | 241 (10) | | | | |
| 4. Use algorithm for division | | | | | | | |
| Relating division to subtraction of multiples of divisor | | | | | 262-7 (10)<br>84-87 (10)/<br>CT (1) | | |
| Remainders in division | | | | | 278-9 (10)<br>91-2 (10)/<br>CT (2) | | |
| Checking division | | | | | 280 (10) 92<br>(8) | | |
| Regular algorithm-single-digit divisor and 2-digit quotient | | | | | 272-4 (10)<br>88-9 (10)/<br>CT (5) | | |
| XII. RATIONAL NUMBERS | | | | | | | |
| 1. Recognize fractions as descriptors of part-whole relationship | | | | | | | |
| 1/2 | | | | | | 286-9 (4)<br>94 (6)/CT<br>(3) | |
| 1/3 | | | | | | 286-7 (7)<br>94 (6)/CT (1) | |
| 1/4 | | | | | | 286-9 (7)<br>94 (4)/CT (1) | |
| 1/5 | | | | | | 286-9 (7)<br>95 (4)/CT (2) | |

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|---|---|---|---|---|---|---|---|
| Division | | | | | 268-9,275-6,281,283 (10)/CT(2) | | |
| 3. Solve verbal problems involving fractions | | | | | | 289(8) | |
| 4. Solve problems involving money recognition and values | | | | | | | |
| Pennies | | | | | | | |
| Nickels | | | | | | | |
| Dimes | | | 211(3) | | | | |
| Quarters | | | | | | | |
| Half dollars | | | | | | | |
| Dollars and cents | | | | | 271(10) | | |
| XV. LOGIC | | | | | | | |
| 1. Use informal logic in computation | | | | | | | |
| Reasoning in subtraction | | | | | | | |
| Reasoning in addition | | | | | | | |
| Reasoning in division | | | | | | | |
| XVI. NUMBER THEORY | | | | | | | |
| 1. Recognize properties of special sets of whole numbers | | | | | | | |
| Odd and even numbers | | 198-200(10)<br>62(10)/CT(3) | | | | | |
| Odd-even sums and products | | 200(10)/CT(2) | | | | | |
| Factors and multiples | | 201-3(10)<br>63(10)/CT(10) | | | | | |
| Prime numbers | | 204-5(10)<br>64(7)/CT(5) | | | | | |

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| XVII. ESTIMATION | | | | | | | |
| 1. Estimate results of mathematical operations | | | | | | | |
| Products | | | 238-9(10)<br>75(10)/CT<br>(4) | | | | |
| 2. Estimate measurements | | | | | | | |
| Area | | | | | | | |
| Distance and length | | | | | | | |
| XVIII. MEASUREMENT | | | | | | | |
| 1. Recognize and use systems for linear measurement | | | | | | | |
| Centimeter | | | | | | | |
| Inch (nearest inch) | | | | | | | |
| --Half inch (nearest half inch) | | | | | | | |
| Foot | | | | | | | |
| Yard | | | | | | | |
| Mile | | | | | | | |
| General units | | | | | | | |
| 2. Recognize and use systems for measuring volume | | | | | | | |
| Cup, pint, quart | | | | | | | |
| Gallon | | | | | | | |
| Ounce (liquid) | | | | | | | |
| General units of volume | | | | | | | |
| Cubic inch, centimeter | | | | | | | |
| Volume of a cube | | | | | | | |
| Volume of irregular objects | | | | | | | |
| 3. Recognize and use systems for measuring area | | | | | | | |
| Square unit | | | | | | | |
| --General | | | | | | | |
| --Inch, centimeter | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 4. Determine area (by counting units)<br>Rectangle<br>Square<br>Triangle<br>Irregular shapes | | | | | | | |
| 5. Recognize units of time-second, minute, hour, day, week, month | | 227 (7) | | | | | |
| XIX. GEOMETRY | | | | | | | |
| 1. Recognize and construct basic figures | | | | | | | |
| a) Line | | | | | | | |
| Lines through a common point | | | | | | | |
| Line through two points | | | | | | | |
| b) Ray | | | | | | | |
| Rays from common point | | | | | | | |
| c) Line segments | | | | | | | |
| Line segment between two points | | | | | | | |
| Number of line segments in a figure | | | | | | | |
| Midpoint of line segment | | | | | | | |
| d) Angle | | | | | | | |
| Angles in a triangle | | | | | | | |
| Right angles | 190-1 (3) | | | | | | |
| Right angles in a circle | 192-3 (1) | | | | | | |
| 2. Construct geometric shapes and state relationships among various components | | | | | | | |
| a) Triangle | | | | | | | |
| Points inside and outside | | | | | | | |
| Sum of angles in a triangle | | | | | | | |

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|---|---|---|---|---|---|---|
| Right triangle | 194-5(4) | | | | | |
| --Leg, hypotenuse | 194(2) | | | | | |
| --Pythagorean relationship (non-formal) | 194-5(1) | | | | | |
| b)Quadrilateral | | | | | | |
| Points inside and outside | | | | | | |
| Triangles in a quadrilateral | | | | | | |
| Quadrilaterals in a triangle | | | | | | |
| Sum of angles in a quadrilateral | | | | | | |
| c)Polygon | | | | | | |
| Vertices, diagonal | | | | | | |
| Number of diagonals | | | | | | |
| Pentagon (name) | | | | | | |
| Hexagon (name) | | | | | | |
| d)Parallel Lines | | | | | | |
| e)Angles and parallel lines | | | | | | |
| Relationship between angles formed by a transversal | | | | | | |
| f)Parallelogram | | | | | | |
| Triangles in parallelogram | | | | | | |
| Rhombus | 191(1) | | | | | |
| g)Circle | 192-3(5) | | | | | |
| Center of a circle | 193(1) | | | | | |
| Right angles inside a circle | 193(1) | | | | | |
| h)Rectangle | 194-5(1) | | | | | |
| Triangles in a rectangle | 194-5(2) | | | | | |
| Square | 195(1) | | | | | |
| i)Symmetry | | | | | | |

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|---|---|---|---|---|---|---|---|
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | |
| 1. Recognize and use concepts in coordinate geometry | | | | 246-53(10) | | | |
| Coordinates | | | | 249-53(10) | | | |
| Coordinate axis | | | | 246-9(10) | | | |
| Number pairs (graphing) | | | | 248-51(10) | | | |
| 2. Develop and interpret simple graphs | | | | 250-1 (5) | | | |
| Graphs of functions | | | | 250-1(5) | | | |
| Graphs with negative numbers | | | | 252-3(3) | | | |
| 3. Interpret charts and maps | | | 240(10) | | 261(9) | | |
| XXI. SPECIAL TOPICS | | | | | | | |
| 1. Recognize concept of a "function machine" | | | | | | | |
| Addition and subtraction | | | | | | | |
| Multiplication and division | | | | | 258(10)81 (10) | | |
| Repeated subtraction | | | | | 259(10) | | |
| Even numbers | | 198-9(8) | | | | | |
| 2. Approximate simple probabilities | | | | | | | |
| | | | | | | | |
| CHAPTER REVIEW | | 207(10)<br>65(10) | 244-45(10)<br>77(10) | | 284-85(10)<br>93(10) | 295(10)<br>96(10) | |
| CUMULATIVE REVIEWS ("Keeping in Touch") | | 206(10) | 228-9,242-3 (10) | | 260, 270<br>282(10) | 294(10)/ CT(10) | |

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| 1/6 | | | | | | 288-9(5) 95(4) | |
| 1/8 | | | | | | 288-9(3) 95(4) | |
| Equivalent fractions | | | | | | 292-3(4)/ CT(4) | |
| Numerators greater than one | | | | | | 290-1(10) 94-5(10)/ CT(7) | |
| 2. Relate fractions to concept of number pair | | | | | | 286-91(2) | |
| 3. Order of rational numbers | | | | | | 289(6)/ CT(2) | |
| XIII. RATIO AND PROPORTION | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | |
| 1. Solve verbal problems involving special topics | | | | | | | |
| Travel (odometer) | | | | | | | |
| Science | | | | | | | |
| Games (scoring) | | | | | | | |
| Shopping | | | | | | | |
| Speed | | | 214-5(10) | | | | |
| Space travel | | | 231 | | | | |
| Time | | | 227 | | 277 | | |
| 2. Solve problems embedded in short stories | | | | | | | |
| Addition and subtraction | | | | | | | |
| Multiplication | | | 219,223,225 227,231,233 235,237(10) 73,76(10)/ CT(5) | | | | |
| --and pairing | | | | | | | |

LMS MATH

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|---|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | | |
| 1. Recognize and relate concepts of set, number and numeral | 1(1) | 22-23(10)/ CT(1) | | | | | | |
| 2. Relate operations on whole numbers to set operations | | | | | | | | |
| Addition | | 22-23(5)<br>7(2) | | | | | | |
| Multiplication | | | | 72(10)<br>19(7)/CT (1) | | | | |
| Division | | | | 73,96(10)/ CT(1) | | | | |
| 3. Relate sets and subsets to fractions | | | | | | | | |
| Fractions | | | | | | | | |
| Equivalent fractions | | | | | | | | |
| 4. Relate regions and subregions to fractions | | | | | | | | |
| Fractions | | | | | | | | |
| Equivalent fractions | | | | | | | | |
| 5. Perform set operations | | | | | | | | |
| Union | | 22(4)<br>7(3) | | | | | | |
| Product sets (cross products) | | | | 104-106(10) | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Recognize the number of elements in sets grouped by | | | | | | | | |
| --Tens and ones | 2-3(10)<br>1(3) | | | | | | | |
| --Hundreds, tens and ones | 4,6(3)<br>1(2) | | | | | | | |
| --Thousands, hundreds, tens and ones | 6-7(3)<br>2(2)/CT(1) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. Compare the number of elements in sets grouped by thousands, hundreds and tens | 8(50<br>3(3) | 47(3) | | | | | | |
| 3. Associate numerals for whole number and place value descriptors using words and expanded numerals | | | | | | | | |
| Given numerals, identify place value | | | | | | | | |
| --2-digit numerals | 3,9(10)<br>1(3) | | | | | | | |
| --3-digit numerals | 5,9(10)<br>1(6) | | | | | | | |
| --4-digit numerals | 7,9,12-13(10)<br>2(4) | 16(7) | | | | | | |
| --5-digit numerals | 12-17(10)/CT(3) | | | | | | | |
| --6-digit numerals | 12-17(10)<br>5(10)/CT(1) | | | | | | | |
| Given place values, identify numerals | | | | | | | | |
| --2-digit numerals | 3,9(10)<br>1(3)/CT(1) | | | | | | | |
| --3-digit numerals | 5,9(10)<br>1(3)/CT(1) | | | | | | | |
| --4-digit numerals | 7,9(10)<br>2(7)/CT(1) | | | | | | | |
| --5-digit numerals | 16-7(10) | | | | | | | |
| --6 or higher digit numerals | 16-7(10)<br>1(2) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 4. Recognize the meaning of the words decade, century, millennium | 10-11(10) | | | | | | | |
| III. OPERATIONS | | | | | | | | |
| 1. Multiply and divide whole numbers | (See XI) | | | | | | | |
| 2. Add and subtract rational numbers | (See XII-9) | | | | | | | |
| 3. Recognize inverse operations | | | | | | | | |
| Addition-subtraction | | 24(10)<br>8(2)/CT<br>(1) | | | | | | |
| Multiplication-division | | | | 76(6)/CT<br>(1) | | CT(1) | | |
| IV. SEQUENCES | | | | | | | | |
| 1. Identify a rule in a number sequence by providing the missing elements to continue the sequence | 4(3) | 45(10) | | | | | | |
| V. INEQUALITIES | | | | | | | | |
| 1. Compare two whole numbers by | | | | | | | | |
| Identifying number "less than" or "greater than" a specified number | 9(10)<br>4(10) | 47(10) | | | | | | |
| Using symbols <, >, = | 9(10)<br>4(10)/CT<br>(3) | 47(10) | | | | | | |
| Writing the number which is a specified value "less than" or "greater than" | 9(10)<br>3,5(10)/<br>CT(3) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. Compare two rational numbers by Using symbols <, >, = Agreeing or disagreeing with statements of inequality | | | | | | | | |
| 3. Compare two rational numbers in mixed numeral notation Using symbols <, >, = | | | | | | | | |
| 4. Recognize inequalities in estimation | (See XVII-1) | | | | | | | |
| 5. Use symbols <, >, = in comparing addition and subtraction expressions | | 60(10) | | | | | | |
| VI. NOTATION 1. Relate two numerical quantities by the symbol =, or ≠ | (See also V-1, 2, 3 and 5) | | | | | | | |
| VII. NUMBER FACTS 1. Use multiplication facts for the digits 0 - 9 to complete a 10 by 10 multiplication table | | | | 83-85(10) 23-24(10) | | | | |
| VIII. EQUATIONS AND SOLUTIONS 1. Determine solutions to arithmetic equations* Addition and subtraction | | 24,34(10) 8,10(10)/ CT(4) | | | | | | |
| Multiplication and division | | | | 91-95(10) 25(10)/CT (4) | | 138-141,144-145(10) 38-41(10)/ CT(5) | | |
| Equations with rational numbers | | | | | | | | |

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| IX. NUMBER LINE | | | | | | | | |
| 1. Illustrate order of rational numbers on the number line by indicating proper placement | | | | | | | | |
| Fractions | | | | | | | | |
| Mixed numerals | | | | | | | | |
| 2. Recognize operations represented on the number line | | | | | | | | |
| Addition-subtraction of whole numbers | | 23,25(6)<br>7-8(4) | | | | | | |
| Multiplication-division of whole numbers | | | | 74-76(8)/<br>CT(2) | | | | |
| Addition-subtraction of rational numbers | | | | | | | | |
| 3. Represent moves on the number line with special numerals | | | | 88-90(10) | | | | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize and use basic principles for addition-subtraction | | | | | | | | |
| Commutative principle (addition) | | 30,32 (10)<br>10(6)/CT<br>(1) | | | | | | |
| Associative principle and using parentheses | | 31-32(10)<br>10(6) | | | | | | |
| 2. Recognize and use basic principles for multiplication-division | | | | | | | | |
| Commutative principle | | | | 79(10)<br>21(10) | | | | |
| Associative principle and using parentheses | | | | CT(1) | | 136(10)/<br>CT(1) | | |
| Distributive principle | | | | 80-81(10)<br>22(10)/CT<br>(1) | | | | |
| Zero in multiplication | | | | 82(7)<br>21(6) | | | | |

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|---|---|---|---|---|---|---|---|---|
| One in multiplication<br><br>Zero in division<br><br>One in division | | | | 82(6)<br>21(6)<br>94(7)<br>26(5)/CT(1)<br>94(10)<br>26(10)/CT(1) | | | | |
| XI. PROCESSES (ALGORITHMS)<br>1. Add whole numbers<br>Two single digit addends with multiple renaming<br><br>2-digit addends with multiple renaming<br><br>3 or more digit addends with multiple renaming<br><br>3 or more addends | | 34-35(10)<br>7,10-11(10)/CT(2)<br>36-37(10)<br>12(10)/CT(1)<br>38-40(10)<br>13(10)/CT(3)<br>34-35(10)<br>10-11(10)/CT(2) | | | | | | |
| 2. Subtract whole numbers<br>1-digit or 2-digit numeral with renaming<br><br>1-digit, 2-digit or 3-digit numeral from a 3-digit numeral with renaming<br>Numerals with more than 3-digits | | 24-5,49-50(10)<br>8,14(10)/CT(2)<br>49-52(10)<br>14,16(10)/CT(3)<br>52(10)<br>15-16(10)/CT(1) | | | | | | |
| 3. Relate multiplication to repeated addition | | | | 74(10)<br>20(7)/CT(1) | | | | |

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|---|---|---|---|---|---|---|---|---|
| 4. Multiply whole numbers | | | | | | | | |
| 1-digit numeral by 1-digit numeral | | | | 86(10)/CT(2)<br>86(10) | | | | |
| One or two 2-digit factors | | | | | | | | |
| One or two 3-digit factors | | | | | | | | |
| One or two 4 or more digit factors | | | | | | | | |
| Three or more factors | | | | | | | | |
| By factors of 10, 100 ... | | | | | | 135-138(10<br>38-39(10)/CT(4) | | |
| By factors of 20, 30 ... | | | | | | 134,137,145(10)<br>40-41(10)/CT(4) | | |
| 5. Identify related products ( 3 x 4, 3 x 40, 3 x 400, etc.) | | | | | | | | |
| 6. Divide whole numbers | | | | | | | | |
| Quotients by repeated subtraction | | | | 75(7)<br>20(4)<br>93(10)<br>25(10) | | | | |
| Quotients as missing factors | | | | | | 138-139(10<br>40-41(10)/CT(1) | | |
| Special quotients (10, 20, 30 ...) | | | | | | 140-1,145(10)<br>40-41(10) | | |
| Quotients by group subtraction | | | | | | | | |
| Using estimation to help find quotients | | | | | | | | |
| Quotients with remainders | | | | | | | | |
| By multiples of 10 | | | | | | | | |
| 2-digit dividend by 1 or 2-digit divisor | | | | 92-3,95,98(10)/CT(2) | | 140(10) | | |
| 3 or more digit dividend by divisors to 3-digits | | | | | | 140(10)/CT(3) | | |
| 2-digit divisors | | | | | | | | |
| 2 and 3-digit quotients | | | | | | | | |
| Quotients and checking | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 7. Apply function machine algorithm to describe operations with whole numbers | | 29(10)<br>9(10)/CT<br>(1) | | 100-1(10)<br>27(10)/CT<br>(1) | | | | |
| 8. Use an intuitive algorithm for finding the arithmetic average for a set of numbers | | | | | | | | |
| XII. RATIONAL NUMBERS | | | | | | | | |
| 1. Relate sets and regions to fractions | (See I-3, 4) | | | | | | | |
| 2. Identify the terms numerator and denominator | | | | | | | | |
| 3. Identify sets of equivalent fractions | | | | | | | | |
| By using subsets and subregions<br>By multiplying numerator and denominator by the same number | (See I-3, 4) | | | | | | | |
| 4. Test for equivalence of two fractions by cross multiplying | | | | | | | | |
| 5. Relate rational numbers by rewriting<br>--Improper fractions to mixed numeral notation<br>--Mixed numeral notation to improper fractions | | | | | | | | |
| 6. Compare fractions and mixed numerals using symbols or by indicating agreement or disagreement with inequality statements | (See V-2, 3) | | | | | | | |
| 7. Illustrate order of fractions and mixed numerals on the number line | (See IX-1) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 8. Recognize the representation of addition and subtraction of fractions on the number line | (See IX-2) | | | | | | | |
| 9. Add and subtract rational numbers in fraction form | | | | | | | | |
| 10. Use rational numbers in fraction and mixed numeral form to express linear measure | | | | | | | | |
| 11. Use fractions to compare quantities or measures | | | | | | | | |
| 12. Identify fraction with lowest terms within a set of equivalent fractions | | | | | | | | |
| XIII. RATIO AND PROPORTION | | | | | | | | |
| 1. Relate ratio and proportion to fractions | | | | | | | | |
| Subsets of objects | | | | | | | | |
| Numbers compared by the words "out of" | | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | | |
| 1. Solve written word problems involving special topics | | | | | | | | |
| Map reading | | | | | 117(10) | | | |
| Estimation | | | | | | | | 164-5(10)/ CT(2) |
| Averages | | | | | | | | |
| Clock problems | | | | | | | | |
| Weights | | 59(9) | | 102(6) | | | | |
| Temperature | | | | | | | | |
| General interest | | 27,43,54-5 (10) | | 87,99(10) | | | | |
| Science topics | 10-11, 20(6) | 41,50,53 (10) | | 103(7) | | | | |

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|---|---|---|---|---|---|---|---|---|
| Geography topics | 18-19(10) | | | | | | | |
| Money | | 42(2) | | | | | | |
| 2. Solve word problems embedded in short stories using arithmetic operations | | | | | | | | |
| Addition-subtraction | | 26(10)<br>11,17(10)/CT(2) | | 28-29(10) | | | | |
| Multiplication-division | | | | 77,97(10)<br>28-29(10)/CT(5) | | 143(3)<br>CT(1) | | |
| 3. Solve word problems involving rational numbers in fraction notation | | | | | | | | |
| XV. LOGIC | | | | | | | | |
| 1. Use informal logic in computation | | | | | | | | |
| Reasoning in addition | | 33,44(10) | | | | | | |
| Reasoning in subtraction | | 61(6) | | | | | | |
| Reasoning in multiplication-division | | | | | | 142(10) | | |
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Recognize properties of special sets of whole numbers | | | | | | | | |
| Odd and even numbers | | | | | | | | |
| Factors and products | | | | | | | | |
| Common factors | | | | | | | | |
| Greatest common factor | | | | | | | | |
| Prime numbers | | | | | | | | |
| XVII. ESTIMATION | | | | | | | | |
| 1. Estimate results of mathematical operations | | | | | | | | |
| Sums and differences | | | | | | | | 158-9,162(10)<br>44(5)/CT(6) |

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|---|---|---|---|---|---|---|---|---|
| Products | | | | | | | | 160-1(10)<br>44-5(10)/CT(4) |
| Quotients | | | | | | | | 163(10)<br>45(10)/CT(2) |
| Multiples of 10 | | | | | | | | 157(8)<br>43(10)/CT(3) |
| Multiples of 100 | | | | | | | | 157(8)<br>43(10)/CT(3) |
| 2. Estimate measurements<br>Length<br>Perimeter | | | | | 116(10)<br>124-5(7) | | | |
| 3. Estimate solutions to word problems | | | | | | | | 164-5(10)/CT(2) |
| XVIII. MEASUREMENT<br>1. Recognize and use units of linear measure with lines and objects<br>General unit | | | | | 112-114(10) | | | |
| Inch | | | | | 31-2(10)/CT(1)<br>115(8)<br>32(3)/CT(3) | | | |
| Centimeter | | | | | 115,117(10)<br>32(3)/CT(3) | | | |
| Nearest inch or centimeter | (See XVII-2) | | | | | | | |
| 2. Determine the area of plane surfaces by counting<br>General unit (concept) | | | | | 112-3(4)<br>31(4) | | | |

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|---|---|---|---|---|---|---|---|---|
| Squares, rectangles and triangles (sq. units) | | | | | 118-121 (10)<br>33,35 (6)/CT (1) | | | |
| Irregular shapes (sq. units) | | | | | 118-9 (10)<br>33 (6)/CT (2) | | | |
| Rectangles (sq. centimeter) | | | | | 121 (4)<br>33 (3)/CT (1) | | | |
| 3. Use multiplication to determine area and volume<br>Rectangles (sq. units)<br>Rectangular solids (cubic units) | | | | | | | | |
| 4. Determine the volume of a solid by counting units<br>General unit (concept) | | | | | 112-3 (4)<br>31 (4)/CT (1) | | | |
| Rectangular solids (cubic units) | | | | | 122-3 (10)<br>34 (5)/CT (2) | | | |
| Irregular solids (cubic units) | | | | | 122-3 (6)<br>34 (2)/CT (1) | | | |
| 5. Determine perimeter of polygons<br>Estimating<br>Using ruler | (See XVII-2) | | | | 126-7 (10)<br>35 (3)/CT (1) | | | |
| Adding lengths of sides | | | | | 126 (10)<br>35 (6)/CT (2) | | | |
| 6. Recognize and compare units of measure<br>Ounces, cups, pints, quarts, gallons | | | | | 128 (10)<br>36 (10)/CT (2) | | | |

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|---|---|---|---|---|---|---|---|---|
| Inches, feet, yards, miles | | | | | 129-130<br>(10)/CT(2) | | | |
| Seconds, minutes, hours, days, weeks | | | | | 130-1(7) | | | |
| Square feet, square yards | | | | | 129(1) | | | |
| Cubic feet, cubic yards | | | | | 129(1) | | | |
| Ounces, pounds, ton | | | | | 130-1(3) | | | |
| 7. Add and subtract units of measure, with renaming of the sum or difference | | | | | | | | |
| XIX. GEOMETRY | | | | | | | | |
| 1. Construct simple closed curves and recognize properties | | | | | | | | |
| Inside | | | 64-5(10) | | | | | |
| Outside | | | 64-5(10) | | | | | |
| 2. Construct circles using a compass and identify components | | | | | | | | |
| Radius | | | 68-9(7) | | | | | |
| Center | | | 64-71(4) | | | | | |
| Diameter | | | 70(3) | | | | | |
| Chord | | | 70(3) | | | | | |
| Tangent | | | | | | | 148-9(5) | |
| Central angle | | | | | | | 150-1(4) | |
| Inscribed angle | | | | | | | 150-1(4) | |
| Inscribed circle | | | | | | | 152-3(2) | |
| Circumscribed circle | | | | | | | 154-5(2) | |
| Circle through one point | | | 66-7(10) | | | | | |
| Circle through two points | | | 69(7) | | | | | |
| Circle through three points | | | 71(3) | | | | | |
| 3. Construct paper models of solid figures and identify properties | | | | | | | | |
| Cubes | | | | | | | | |
| --Faces | | | | | | | | |
| --Edges | | | | | | | | |
| --Vertices | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Triangular pyramids<br>--Faces<br>--Edges<br>--Vertex<br>Cylinders<br>Cones | | | | | | | | |
| 4. Write number pair co-ordinates in a Cartesian axis | | | | | | | | |
| 5. Plot points defined by a number pair in a Cartesian axis | | | | | | | | |
| 6. Complete a function pair and graph the points on a Cartesian axis<br>Single quadrant<br>Four quadrants (use of negative numbers)** | | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS<br>1. Interpret information from<br>Maps<br>Bar graphs and charts | | | | | 117 (7) | | | |
| XXI. SPECIAL TOPICS<br>1. Define and utilize function rules to describe operations on whole numbers | | 29 (6)<br>9 (2)/CT (1) | | 100-1 (10) | | | | |
| CHAPTER REVIEW | 21 (10)<br>6 (10) | 62-3 (10)<br>18 (10) | | 110-1 (10)<br>30 (10) | 132-3 (10)<br>37 (10) | 147 (10)<br>42 (10) | | 167 (10)<br>46 (10) |
| CUMULATIVE REVIEW ("Keeping in Touch") | | 46-7 (10) | | 78, 108-9 (10) | | 146 (10)/ CT (10) | | 166 (10) |

** This lesson is for advanced students.

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|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | |
| 1. Recognize and relate concepts of set, number and numeral | | | | | | | |
| 2. Relate operations on whole numbers to set operations<br>Addition<br>Multiplication<br>Division | | | | | | | |
| 3. Relate sets and subsets to fractions<br>Fractions<br><br>Equivalent fractions | | | | | | 252-7(10)<br>76,78(5)/<br>CT(1)<br>258-9(10)<br>79(2) | |
| 4. Relate regions and subregions to fractions<br>Fractions<br><br>Equivalent fractions | | | | | | 252-7(10)<br>76,78(7)/<br>CT(4)<br>260-5(10)<br>79-80(7)/<br>CT(4) | |
| 5. Perform set operations<br>Union<br>Product sets (cross products) | | | | | | | |
| II. PLACE VALUE | | | | | | | |
| 1. Recognize the number of elements in sets grouped by<br>--Tens and ones<br>--Hundreds, tens and ones<br>--Thousands, hundreds, tens and ones | | | | | | | |
| 2. Compare the number of elements in sets grouped by thousands, hundreds and tens | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 3. Associate numerals for whole number and place value descriptors using words and expanded numerals<br>Given numerals, identify place value<br>--2-digit numerals<br>--3-digit numerals<br>--4-digit numerals<br>--5-digit numerals<br>--6-digit numerals<br>Given place values, identify numerals<br>--2-digit numerals<br>--3-digit numerals<br>--4-digit numerals<br>--5-digit numerals<br>--6 or higher digit numerals | | | | | | | |
| 4. Recognize the meaning of the words decade, century, millennium | | | | | | | |
| III. OPERATIONS | | | | | | | |
| 1. Multiply and divide whole numbers | (See XI) | | | | | | |
| 2. Add and subtract rational numbers | (See XII-9) | | | | | | |
| 3. Recognize inverse operations<br>Addition-subtraction<br>Multiplication-division | | | | | | | |
| IV. SEQUENCES | | | | | | | |
| 1. Identify a rule in a number sequence by providing the missing elements to continue the sequence | | | | | | | |

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| V. INEQUALITIES | | | | | | | |
| 1. Compare two whole numbers by<br>Identifying number "less than" or "greater than" a specified number<br>Using symbols < , >, =<br>Writing the number which is a specified value "less than" or "greater than" | | | | | | | |
| 2. Compare two rational numbers by<br>Using symbols <, >, = | | | | | | | 304 (10)<br>92 (10)/CT (3)<br>307 (10)<br>91 (10)/CT (4) |
| Agreeing or disagreeing with statements of inequality | | | | | | | |
| 3. Compare two rational numbers in mixed numeral notation<br>Using symbols <, >, = | | | | | | | 312 (10) |
| 4. Recognize inequalities in estimation | (See XVII-1) | | | | | | |
| 5. Use symbols <, >, = in comparing addition and subtraction expressions | | | | | | | |
| VI. NOTATION | | | | | | | |
| 1. Relate two numerical quantities by the symbol =, or ≠ | (See also V-1, 2, 3 and 5) | | | | | 270 (10) | |
| VII. NUMBER FACTS | | | | | | | |
| 1. Use multiplication facts for the digits 0 - 9 to complete a 10 by 10 multiplication table | | | | | | | |

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|---|---|---|---|---|---|---|---|
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | |
| 1. Determine solutions to arithmetic equations* | | | | | | | |
| Addition and subtraction | | | | | | | |
| Multiplication and division | | | | | | | |
| Equations with rational numbers | | | | | | | 310,314-5 (10)/CT(1) |
| IX. NUMBER LINE | | | | | | | |
| 1. Illustrate order of rational numbers on the number line by indicating proper placement | | | | | | | |
| Fractions | | | | | | | 292-7,301, 304-7(10) 88-90(10)/ CT(5) |
| Mixed numerals | | | | | | | 311-2(10) 93,95(10)/ CT(4) |
| 2. Recognize operations represented on the number line | | | | | | | |
| Addition-subtraction of whole numbers | | | | | | | |
| Multiplication-division of whole numbers | | | | | | | |
| Addition-subtraction of rational numbers | | | | | | | 308-9(10) 94(7) |
| 3. Represent moves on the number line with special numerals | | | | | | | |
| X. BASIC PRINCIPLES | | | | | | | |
| 1. Recognize and use basic principles for addition-subtraction | | | | | | | |
| Commutative principle (addition) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| Associative principle and using parentheses | | | | | | | |
| 2. Recognize and use basic principles for multiplication-division | | | | | | | |
| Commutative principle | | | | | | | |
| Associative principle and using parentheses | | | | | | | |
| Distributive principle | 168-170(10)<br>47(10)/CT(2) | | | | | | |
| Zero in multiplication | | | | | | | |
| One in multiplication | | | | | | | |
| Zero in division | | | | | | | |
| One in division | | | | | | | |
| XI. PROCESSES (ALGORITHMS) | | | | | | | |
| 1. Add whole numbers | | | | | | | |
| Two single digit addends with multiple renaming | | | | | | | |
| 2-digit addends with multiple renaming | | | | | | | |
| 3 or more digit addends with multiple renaming | 188(5) | | | | | | |
| 3 or more addends | | | | | | | |
| 2. Subtract whole numbers | | | | | | | |
| 1-digit or 2-digit numeral with renaming | | | | | | | |
| 1-digit, 2-digit or 3-digit numeral from a 3-digit numeral with renaming | | | | | | | |
| Numerals with more than 3-digits | 188(5) | | | | | | |
| 3. Relate multiplication to repeated addition | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 4. | Multiply whole numbers | | | | | | | |
| | 1-digit numeral by 1-digit numeral | | | | | | | |
| | One or two 2-digit factors | 170-1,176, 178(10) 48,49,51-2 (10)/CT(8) | | | | | | |
| | One or two 3-digit factors | 172-3,182, 184,186(10) 48-9,52,54-56(10)/CT (4) | | | | | | |
| | One or two 4 or more digit factors | 172-3(10) 49(5) | | | | | | |
| | Three or more factors | 171,186(10)/ CT(1) | | | | | | |
| | By factors of 10, 100 ... | | | | | | | |
| | By factors of 20, 30 ... | 176,183(10) 50(10)/CT(2) | | | | | | |
| 5. | Identify related products (3 x 4, 3 x 40, 3 x 400, etc.) | 176(10) 50(8) | | | | | | |
| 6. | Divide whole numbers | | | | | | | |
| | Quotients by repeated subtraction | | | | | | | |
| | Quotients as missing factors | | | | | | | |
| | Special quotients (10, 20, 30 ...) | | | | | | | |
| | Quotients by group subtraction | | | 205,209(10) 58-9(10) | | | | |
| | Using estimation to help find quotients | | | 200,208,214, 220,224(10) 60,64,66, 67(10)/CT (6) | | | | |

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| Quotients with remainders | | | 203,210-1 (10)<br>61,64-6,68-9(10)/CT (5) | | | | |
| By multiples of 10 | | | 221(10)<br>66(8) | | | | |
| 2-digit dividend by 1 or 2-digit divisor | | | 221-2,225 (10)<br>68-9(10) | | | | |
| 3 or more digit dividend by divisors to 3-digits | | | 204-16, 222,225(10)<br>60-1,64-9 (10)/CT(7) | | | | |
| 2-digit divisors | | | 221-2,225 (10)<br>68-9(10)/CT(4) | | | | |
| 2 and 3-digit quotients | | | 207-15, (10)<br>61,64-5,69 (10)/CT(7) | | | | |
| Quotients and checking | | | 210-1(10)<br>61,65(10) | | | | |
| 7. Apply function machine algorithm to describe operations with whole numbers | | | | 235,240 (10) | | | |
| 8. Use an intuitive algorithm for finding the arithmetic average for a set of numbers | | | 212-3(10) | | | | |
| XII. RATIONAL NUMBERS<br>1. Relate sets and regions to fractions | (See I-3, 4) | | | | | | |

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| 11. Use fractions to compare quantities or measures | | | | | | 83-4(10)/CT(1) | |
| 12. Identify fraction with lowest terms within a set of equivalent fractions | | | | | | 86(10)/CT(3) | 246,300(10)/CT(10) |
| XIII. RATIO AND PROPORTION | | | | | | | |
| 1. Relate ratio and proportion to fractions | | | | | | | |
| Subsets of objects | | | | | | 252-4(10) | |
| Numbers compared by the words "out of" | | | | | | 254-5(10) | |
| XIV. PROBLEM SOLVING | | | | | | | |
| 1. Solve written word problems involving special topics | | | | | | | |
| Map reading | | | | | | | |
| Estimation | | | | | | | |
| Averages | | | 213(4)<br>62(10)/CT(2) | | | | |
| Clock problems | | | 229(10) | | | 271(9)<br>287(10) | |
| Weights | | | | | | | |
| Temperature | | | 217(5) | | | | |
| General interest | 181(5) | | 223(7) | | | | |
| Science topics | 187(8) | | 217,231(10) | | | | |
| Geography topics | 175,185,189(10) | | 219(4) | | | 289(6) | 303,317(10) |
| Money | | | | | | | |
| 2. Solve word problems embedded in short stories using arithmetic operations | | | | | | | |
| Addition-subtraction | 180(8) | | | | | | |
| Multiplication-division | 180(4)<br>53(10)/CT(1) | | 201,226(10)<br>63,70(10)/CT(2) | | | | |

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|---|---|---|---|---|---|---|---|
| 2. Identify the terms numerator and denominator | | | | | | 268-9(10)<br>82(0) | |
| 3. Identify sets of equivalent fractions | | | | | | | |
| By using subsets and sub-regions | (See I-3, 4) | | | | | | |
| By multiplying numerator and denominator by the same number | | | | | | 266-7(10)<br>81(10)/<br>CT(4) | 298-9(10)<br>CT(1) |
| 4. Test for equivalence of two fractions by cross multiplying | | | | | | 276-7(10)<br>85(8)/CT<br>(2) | |
| 5. Relate rational numbers by rewriting | | | | | | | |
| --Improper fractions to mixed numeral notation | | | | | | | 310-1(10)<br>93(4) |
| --Mixed numeral notation to improper fractions | | | | | | | 310-1(10)<br>93,95(10) |
| 6. Compare fractions and mixed numerals using symbols or by indicating agreement or disagreement with inequality statements | (See V-2, 3) | | | | | | |
| 7. Illustrate order of fractions and mixed numerals on the number line | (See IX-1) | | | | | | |
| 8. Recognize the representation of addition and subtraction of fractions on the number line | (See IX-2) | | | | | | |
| 9. Add and subtract rational numbers in fraction form | | | | | | | 308(10)/<br>CT(2) |
| 10. Use rational numbers in fraction and mixed numeral form to express linear measure | | | | | | 83(5) | 313(4)/<br>CT(1) |

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|---|---|---|---|---|---|---|---|
| 3. Solve word problems involving rational numbers in fraction notation | | | | | | 279,289 (10)<br>77 (7) | 315(5) |
| XV. LOGIC | | | | | | | |
| 1. Use informal logic in computation | | | | | | | |
| Reasoning in addition | | | | | | | |
| Reasoning in subtraction | | | | | | | |
| Reasoning in multiplication-division | | | | | | | |
| XVI. NUMBER THEORY | | | | | | | |
| 1. Recognize properties of special sets of whole numbers | | | | | | | |
| Odd and even numbers | | | | 232-3(5)/CT(5) | | | |
| Factors and products | | | | 234-5,238 (10)<br>72-4(10)/CT(7) | | | |
| Common factors | | | | 236(8)<br>73(10)/CT(3) | | | |
| Greatest common factor | | | | 237(7)<br>73(10)/CT(2) | | | |
| Prime numbers | | | | 239-40(10)<br>74(10)/CT(5) | | | |
| XVII. ESTIMATION | | | | | | | |
| 1. Estimate results of mathematical operations | | | | | | | |
| Sums and differences | | | | | | | |
| Products | | | | | | | |
| Quotients | | | | | | | |

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|---|---|---|---|---|---|---|---|
| Multiples of 10 | | | 208(10)<br>60,66(10) | | | | |
| Multiples of 100 | | | 214(10)<br>64(8) | | | | |
| 2. Estimate measurements<br>Length<br>Perimeter | | | | | | | |
| 3. Estimate solutions to word problems | | | | | | | |
| XVIII. MEASUREMENT<br>1. Recognize and use units of linear measure with lines and objects<br>General unit<br>Inch<br>Centimeter<br>Nearest inch or centimeter | (See XVII-2) | | | | | | |
| 2. Determine the area of plane surfaces by counting<br>General unit (concept)<br>Squares, rectangles and triangles (sq. units)<br>Irregular shapes (sq. units)<br>Rectangles (sq. centimeter) | | | | | | | |
| 3. Use multiplication to determine area and volume<br>Rectangles (sq. units)<br>Rectangular solids (cubic units) | 174(8)<br>179(8) | | | | | | |
| 4. Determine the volume of a solid by counting units<br>General unit (concept)<br>Rectangular solids (cubic units)<br>Irregular solids (cubic units) | | | | | | | |

LMS MATH

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| UNIT<br>PAGES | 7<br>168-191 | GEOMETRY<br>UNIT 3<br>192-199 | 8<br>200-231 | 9<br>232-243 | GEOMETRY<br>UNIT 4<br>244-251 | 10<br>252-289 | 11<br>290-319 |
|---|---|---|---|---|---|---|---|
| 5. Determine perimeter of polygons<br>Estimating<br>Using ruler<br>Adding lengths of sides | (See XVII-2) | | | | | | |
| 6. Recognize and compare units of measure<br>Ounces, cups, pints, quarts, gallons<br>Inches, feet, yards, miles<br>Seconds, minutes, hours, days, weeks<br>Square feet, square yards<br>Cubic feet, cubic yards<br>Ounces, pounds, ton | 56(8)/CT(1) | | | | | | |
| 7. Add and subtract units of measure, with renaming of the sum or difference | | | | | | | |
| ~~XIX~~. GEOMETRY | | | | | | | |
| 1. Construct simple closed curves and recognize properties<br>Inside<br>Outside | | | | | | | |
| 2. Construct circles using a compass and identify components<br>Radius<br>Center<br>Diameter<br>Chord<br>Tangent<br>Central angle<br>Inscribed angle<br>Inscribed circle<br>Circumscribed circle<br>Circle through one point<br>Circle through two points<br>Circle through three points | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 3. Construct paper models of solid figures and identify properties | | | | | | | |
| Cubes | | 192-5 (10) | | | | | |
| --Faces | | 192-5 (2) | | | | | |
| --Edges | | 192-5 (5) | | | | | |
| --Vertices | | 192-5 (2) | | | | | |
| Triangular pyramids | | 196-7 (1) | | | | | |
| --Faces | | 196-7 (2) | | | | | |
| --Edges | | 196-7 (4) | | | | | |
| --Vertex | | 196-7 (2) | | | | | |
| Cylinders | | 198 (1) | | | | | |
| Cones | | 199 (1) | | | | | |
| 4. Write number pair co-ordinates in a Cartesian axis | | | | | 246-7 (10) | | |
| 5. Plot points defined by a number pair in a Cartesian axis | | | | | 246-7 (10) | | |
| 6. Complete a function pair and graph the points on a Cartesian axis | | | | | | | |
| Single quadrant | | | | | 248-9 (10) | | |
| Four quadrants (use of negative numbers)** | | | | | 250-1 (10) | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | |
| 1. Interpret information from | | | | | | | |
| Maps | | | | | | 289 (6) | [illegible] (6) |
| Bar graphs and charts | | | 230 (7) | | | | 317 (10) |
| XXI. SPECIAL TOPICS | | | | | | | |
| 1. Define and utilize function rules to describe operations on whole numbers | | | | 235-40 (5) | | | |

** This lesson is for advanced students.

LMS MATH

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 4

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|---|---|---|---|---|---|---|---|
| CHAPTER REVIEW | 190 (10)<br>57 (10) | | 230 (10)<br>71 (10) | 243 (10)<br>75 (10) | | 288 (10)<br>87 (10) | 318-9 (10)<br>96 (10) |
| CUMULATIVE REVIEW<br>("Keeping in Touch") | 188 (10) | | 218, 228<br>(10) | 242 (10) | | 270, 286<br>(10) | 302, 316 (10) |

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|---|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | | |
| 1. Recognize set of points and numbers | | | | | | | | |
| Sets of points | | | | | 77(1)<br>27(1)<br>CT(1) | | | |
| Sets of number pairs | | 38-9(10)<br>7-8(10)/CT<br>(5) | | | | | | |
| Sets of equivalent fractions | | | | | | | | 188-93(10)<br>64-8(10)/<br>CT(6) |
| Sets of solutions | | | 49-51,65<br>(10) | | | | | |
| 2. Identify operations on sets | | | | | | | | |
| Union | | | | | | | 167(10)<br>57(10)/CT<br>(1) | |
| Intersection | | | | | | | 167(10)<br>57(10)/CT<br>(1) | |
| 3. Relate sets and regions to rational numbers | | | | | | | | 176-89(10)<br>61-7(10)/<br>CT(6) |
| "And", "or" and "not" statements (reasoning) | | | 60(10)/CT<br>(1) | | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Read and write numerals | | | | | | | | |
| Thousands | 5(10)<br>1-2(10)/<br>CT(2) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Millions | 6-7(10)<br>1-2(10)/<br>CT(1) | | | | | | | |
| Billions to Quintillions | | | | | | | | |
| 2. Identify place values of digits in numerals | 7(5)3(1)/<br>CT(3) | | | | | | | |
| Whole numbers | 5-6,10(10)<br>2-3(10)/<br>CT(5) | | | | | | | |
| Decimal numbers | | | | | | | | |
| 3. Recognize numerals in different bases | | | | | | | | |
| Base-10 numerals | 10(4)5(7)/<br>CT(2) | | | | | | | |
| Base-4 numerals | 10-1(10)<br>5(10)/<br>CT(4) | | | | | | | |
| 4. Represent numerals in expanded form | 6(10)3(10)/<br>CT(2) | | | | | | | |
| 5. Write numerals using different notations | | | | | | | | |
| Exponential notation | | | 65(0) | | | | | |
| Decimal notation | | | | | | | | |
| 6. Represent numbers by concrete models | | | | | | | | |
| Abacus | 1-3(10)1(9)/<br>CT(1) | | | | | | | |
| Base ten machine | 4(5)2(4) | | | | | | | |
| III. OPERATIONS | | | | | | | | |
| 1. Add-subtract with rational numbers | (See XI-2) | | | | | | | |
| 2. Multiply-divide with rational numbers | (See XI-2) | | | | | | | |
| 3. Perform operations on base-4 numerals | (See XI-4) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| IV. SEQUENCES | | | | | | | | |
| 1. Recognize and complete sequences involving whole numbers on a set of number lines | | 34-7(10)/ CT(1) | | | | | | |
| Rational numbers | | | | | | | | |
| --Rational numbers on a number line | | | | | | | | |
| Odd and even numbers | | | 59(10) | | | | | |
| V. INEQUALITIES | | | | | | | | |
| 1. Recognize and use relational symbols <, >, =, ≠ | 8-9(10)<br>4(10)/<br>CT(6) | | | | | | | |
| 2. Solve number phrases or sentences involving | | | | | | | | |
| Whole numbers | | | | | | 121-1,124 (10)47-8, 50-1(10)/ CT(2) | | |
| Rational numbers | (See XII-3) | | | | | | | |
| Graphing | | | | | | | | |
| Solution sets | | | | | | 132(10) | | |
| VI. NOTATION | | | | | | | | |
| 1. Recognize symbols related to | | | | | | | | |
| Ancient numerals | | | | | | | | |
| --East Arabic numerals | 15(4) | | | | | | | |
| --Egyptian numerals | 15(3) | | | | | | | |
| --Greek numerals | 15(3) | | | | | | | |
| --Roman numerals | 14(10)/ CT(2) | | | | | | | |
| Hindu-Arabic numerals | | | | | | | | |
| --Whole numbers | | 40(10)<br>9(10)/<br>CT(10) | | | | | | |
| --Rational numbers | | | | | | | | |
| --Fractions | | | | | | | | |
| --Decimals | | | | | | | | |

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| UNIT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| PAGES | 1-17 | 18-45 | 46-65 | 66-75 | 76-101 | 102-159 | 160-175 | 176-205 |
| Functions | | | | | | | | |
| --f(n) | | 19(10)<br>7(10)/<br>CT(3) | | | | | | |
| Sets | | | | | | | | |
| --∩ | | | | | 81(0) | | 166(10)<br>55(10)/<br>CT(1) | |
| --∪ | | | | | | | 166(10)<br>55(10)/<br>CT(1) | |
| Geometry | | | | | | | | |
| --° (degree) | | | | | 89(7)<br>36(2)/<br>CT(2) | | | |
| --≅ | | | | | 80,86(2)<br>28,30(7)<br>78(10)<br>27(6)/<br>CT(2) | | 166(0) | |
| -- ⟷ , ⟶ , ⟝ | | | | | | | | |
| --∠ | | | | | 84-5(10)/<br>CT(1) | | | |
| Variables | | | | | | | | |
| --a,b,c-- | | 20,25(10)<br>8(10)/<br>CT(10) | | | | 122(10) | | |
| Inequalities | | | | | | | | |
| <, >,=, ≠ | (See V-1) | | | | | | | |
| VII. NUMBER FACTS | | | | | | | | |
| 1. Recognize related terms | | | | | | | | |
| Addend | | | | | | | | |
| --Missing addend | | 27(10)<br>10(10)<br>20(0) | | | | | | |
| Sum | | | | | | | | |
| Difference | | 27(10)<br>10(10) | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|
| | Factor | | 23(9) | | | | | | |
| | --Missing factor | | 31(10) | | | | | | |
| | | | 12(10) | | | | | | |
| | Product | | 23,31(10) | 54(10) | | | | | |
| | | | | 18-20(10)/ | | | | | |
| | | | | CT(2) | | | | | |
| | Quotient | | 29,31(10) | | | | | | |
| | | | 12-3(10) | | | | | | |
| | Divisor | | 29(0) | | | | | | |
| 2. | Recall basic operation facts | | | | | | | | |
| | Addition | | 18-21(10) | 58-9(10)/ | | | | | |
| | | | 8-9(10)/ | CT(2) | | | | | |
| | | | CT(6) | | | | | | |
| | --Repeated addition | | 22(10) | | | | | | |
| | | | 8(3)/ | | | | | | |
| | | | CT(1) | | | | | | |
| | Subtraction | | 26-7(10) | | | | | | |
| | | | 10(10)/ | | | | | | |
| | | | CT(1) | | | | | | |
| | --Repeated subtraction | | 28(10) | | | | | | |
| | | | 11(10) | | | | | | |
| | Multiplication | | 23-5(10) | | | | | | |
| | | | 8-9(10)/ | | | | | | |
| | | | CT(7) | | | | | | |
| | --Multiples of 10, 100, and 1000 | | | 50-1(10) | | | | | |
| | | | | 18(10)/ | | | | | |
| | | | | CT(3) | | | | | |
| | --Special products | | | 52-3(10) | | | | | |
| | | | | 19(10)/ | | | | | |
| | | | | CT(7) | | | | | |
| | --Products | | | 54-5(10) | | | | | |
| | | | | 20(10)/ | | | | | |
| | | | | CT(7) | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Division | | 29-33(10)<br>11-2(10)/<br>CT(3) | | | | | | |
| --Zero in division | | 32(10)<br>13(6)/<br>CT(1) | | | | | | |
| --Special quotients | | | 56-7(10)<br>21(10)/<br>CT(2) | | | | | |
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | | |
| 1. Determine solutions to equations | | | | | | | | |
| Multiplication and addition of whole numbers | | 24(10)<br>8-9(10)/<br>CT(1) | | | | | | |
| Multiplication of whole numbers (special products) | (See VII-2) | | 52-3(10)<br>20(10)/<br>CT(7) | | | | | |
| Multiplication and division of whole numbers (special quotients) | (See VII-2) | | 56-7(10)<br>21(10)/<br>CT(2) | | | | | |
| Addition of rational numbers | (See XI-2) | | | | | | | |
| a,b,c---variables | (See VI-1) | | | | | | | |
| 2. Find a set of solutions to several related equations | | | 49-57(10) | | | | | |
| IX. NUMBER LINE | | | | | | | | |
| 1. Use the number line to represent numbers | | | | | | | | |
| Whole numbers | | 34-7(10)/<br>CT(1) | | | | | | |
| Rational numbers | | | | | | | | |
| 2. Use the number line to represent operations | | | | | | | | |
| Estimation of whole numbers | | | | 66-7(10) | | | | |

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|---|---|---|---|---|---|---|---|---|
| Addition-subtraction of rational numbers | | | | | | | | |
| Multiplication of rational numbers | | | | | | | | |
| Graphing | | | | | | | | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize basic principles of mathematical operations | | | | | | | | |
| Associative principle | | | | | | | | |
| --Addition of whole numbers | | | 46,48(10)<br>16-7(5)/<br>CT(1) | | | | | |
| --Addition of rational numbers | | | | | | | | |
| --Addition of modular numbers | | | | | | | | |
| --Multiplication of whole numbers | | | 46,48(2)<br>16-7(5) | | | | | |
| --Multiplication of rational numbers | | | | | | | | |
| --Multiplication of modular numbers | | | | | | | | |
| Commutative principle | | | | | | | | |
| --Addition of whole numbers | | | 46,48(5)<br>16-7(5)/<br>CT(1) | | | | | |
| --Addition of rational numbers | | | | | | | | |
| --Addition of modular numbers | | | | | | | | |
| --Multiplication of whole numbers | | | 46,48(2)<br>16-7(5) | | | | | |
| --Multiplication of rational numbers | | | | | | | | |
| --Multiplication of modular numbers | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Distributive principle<br>--Multiplication of whole numbers | | | 46-8(10)<br>16-7(10)/<br>CT(2) | | | | | |
| --Multiplication of modular numbers | | | | | | | | |
| One principle<br>--Multiplication of whole numbers | | | 46,48(2)<br>16-7(3) | | | | | |
| --Multiplication of rational numbers | | | | | | | | |
| --Multiplication of modular numbers | | | | | | | | |
| Zero principle<br>--Addition of whole numbers | | | 46,48(1)<br>16-7(3) | | | | | |
| --Addition of rational numbers | | | | | | | | |
| --Addition of modular numbers | | | | | | | | |
| XI. PROCESSES (ALGORITHMS)<br>1. Use algorithms for operations on whole numbers | | | | | | | | |
| Addition-subtraction<br>--1, 2, 3, 4-digit numbers | | | | | | 102-9(10)<br>37-8(10)/<br>CT(4) | | |
| --By regrouping | | | | | | 107(10)<br>38(10)/<br>CT(2) | | |
| --More than two addends | | | | | | 102-4(10)<br>37(10)/<br>CT(2) | | |
| --Involving money | | | | | | 104(10)<br>39(10)/<br>CT(2) | | |

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|---|---|---|---|---|---|---|---|---|
| Multiplication<br>--2, 3, 4-digit by 1-digit factors<br>--3, 4-digit by 2-digit factors<br><br>--3, 4-digit by 3-digit factors<br>--Involving money | | | | | | 112-3 (10)<br>41-2 (10)<br>113-4 (10)<br>42 (8)/<br>CT (2)<br>116 (10)<br><br>154 (10)/<br>CT (1) | | |
| Division<br>--1-digit divisors and 2-3-digit quotients<br><br>--Short form<br><br>--2-digit multiple of ten and 1-digit quotients<br>--2-digit divisors and 1-digit quotients<br>--2-digit multiple of ten and 2-digit quotients<br>--2-digit divisors and 2-digit quotients<br><br>--Short form<br><br>--2-digit divisors and 3-digit quotients<br><br>--Zero in the quotient<br>--Involving money | | | | | | 125 (10)<br>43-4 (10)/<br>CT (1)<br>128-9 (10)<br>46 (10)<br>133 (10)<br>47 (8)<br><br>135-6 (10)<br>48-9 (10)<br>143 (10)<br>50 (10)/<br>CT (1)<br>145-7 (10)<br>51 (10)/<br>CT (1)<br>150-1 (10)<br>52 (10)<br>152-3 (10)<br>53 (7)/<br>CT (1)<br>153 (10)<br>154-5 (10)/<br>CT (1) | | |
| 2. Use algorithms for operations on rational numbers | (See XII-4) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 3. Use algorithms for operations on modular numbers<br>12-clock<br>4-clock | (See XXI-3) | | | | | | | |
| XII. RATIONAL NUMBERS<br>1. Recognize related terms<br>Fractions<br>--Numerator<br>--Denominator<br>Decimals<br>--Decimal notation | | | | | | | | 180-1(10)/<br>CT(1)<br>180-1(1)/<br>CT(1) |
| 2. Write numerals for rational numbers<br>Fractions<br>--Equivalent fractions<br>--Lower, higher and lowest terms<br>--Checking<br>--Improper fractions<br>--Mixed numerals<br>--Ratio<br>Decimals | (See XIII-1) | | | | | | | 186-91(10)<br>64-8(10)/<br>CT(6)<br>196-200(10)<br>69(10)/<br>CT(6)<br>192-3(10)<br>68(10)/<br>CT(1)<br>63(10) |
| 3. Relate rational numbers to sets and regions | (See I-3) | | | | | | | |
| 4. Use rational numbers in<br>Measurement<br>Inequalities<br>Graphing | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 5. Perform operations on rational numbers in fraction form<br>Addition-subtraction<br>--Fractions less than 1, similar denominators<br>--Fractions less than 1, different denominators<br>--Using least common denominator algorithm<br>--Fractions more than 1<br>Multiplication<br>--Fractions less than 1<br>--Fractions less than 1 by whole numbers<br>Division<br>--Fractions less than 1<br>--Related to multiplication | | | | | | | | |
| 6. Add-subtract rational numbers in decimal form<br>--1, 2-place decimals less than 1<br>--1, 2-place decimals more than 1<br>--Involving money<br>--Involving metric units | | | | | | | | |
| XIII. RATIO AND PROPORTION | | | | | | | | |
| 1. Use ratio to compare the measure of two objects | | | | | | | | |
| 2. Calculate the distance between two cities on a map drawn to scale | | | | | | | | |
| 3. Draw an object to a specified scale | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XIV. PROBLEM SOLVING | | | | | | | | |
| 1. Solve word problems involving | | | | | | | | |
| Time, weight, distance, etc. | | | | | | 137,139(10)<br>40,44(8)/CT(1) | | |
| Averages | | | | | | 126-7(10)<br>45(10)/CT(1) | | |
| Operations on numbers | | | | | | | 173(10) | |
| Measurement | | | 62(10) | | | | | |
| Geography and population | | | | | | 110-1(10) | | |
| Planets | | | | | | 131(5) | | |
| Airplanes and travel | | | | | | 148-9(10)<br>40,44(3)<br>157(6) | | |
| The Pentagon | | | | | | | | |
| Temperature | | | | | | | | |
| Short stories | | 42(10)<br>14(10)/CT(1) | | | | 118,130(10)<br>40,49(10)/CT(2) | | 201(10) |
| Decimal numbers | | | | | | | | |
| Estimation | | | | 70-3(10)<br>25(10)/CT(5) | | | | |
| 2. Write a problem about a given picture | | | | | | | | 203(5) |
| XV. LOGIC | | | | | | | | |
| 1. Find a set of solutions implied from related equations | | | 49-57(10) | | | | | |
| 2. Make mathematical statements involving | | | | | | | | |
| Deduction, "and" "or" | | | 60-1(10) | | | | | |
| Negation, "not" | | | 60-1(8)/CT(1) | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 3. Solve reasoning problems involving | | | | | | | | |
| Operations | | | 58(10) | | | | | |
| Sets | | | 60-1(10) | | | | | |
| Weights | | | 62(10) | | | | | |
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Recognize special sets of numbers | | | | | | | | |
| Odd and even numbers | | | 59(10) | | | | | |
| Factors | | | | | | | 160-1(10)<br>55(10)/CT(4) | |
| --Common factors | | | | | | | 168-9(10)<br>58(5)/CT(1) | |
| --Greatest common factor | | | | | | | 168-9(10)<br>58(9)/CT(2) | |
| --Factor trees | | | | | | | 162-5(10)<br>55-6(9)/CT(3) | |
| Prime numbers | | | | | | | 164-5(10)<br>56(10)/CT(5) | |
| Multiples | | | | | | | 170(10)<br>59(10)/CT(1) | |
| --Least common multiple | | | | | | | 171(10)<br>59(7)/CT(2) | |
| --Least common denominator | | | | | | | | |
| Equivalent fractions | (See XII-2) | | | | | | | |
| --Lowest terms | | | | | | | | |
| Modular numbers | (See XXI-2) | | | | | | | |
| --12-clock | | | | | | | | |
| --4-clock | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| XVII. ESTIMATION | | | | | | | | |
| 1. Use estimation to perform Mathematical operations on whole numbers | | | | | | | | |
| --Quotients and products | | | | 69(10)<br>24(10)/CT(3) | | 122,124,134,142(10) | | |
| --Multiples of 10, 100 | | | | 67-8(10)<br>23(10)/CT(5) | | | | |
| --Sums and differences | | | | 70-3(10)<br>24(10)/CT(7) | | | | |
| Mathematical operations on rational numbers | | | | | | | | 182-3(0) |
| Measurement | | | | 69(10) | 82-3(10) | | | |
| XVIII. MEASUREMENT | | | | | | | | |
| 1. Recognize and use units of measurement | | | | | | | | |
| Metric units | | | | | | | | |
| --Centimeter | | | | | 82-3(3)<br>29(3)/CT(1) | | | |
| Inch | | | | | 82-3(10)<br>29(2) | | | |
| Foot | | | | | 83(8)<br>29(1) | | | |
| Degree | | | | | 89(6)<br>36(2)/CT(2) | | | |
| Radian | | | | | 89(1) | | | |
| 2. Use measuring instruments | | | | | | | | |
| Ruler | | | | | | | | |
| Protractor | | | | | 90-1(10)<br>31,36(10)/CT(1) | | | |
| Compass | | | | | 92-4(7)<br>32-3,36(10)/CT(1) | | | |

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|---|---|---|---|---|---|---|---|---|---|
| 3. | Determine lengths<br>Perimeter of polygons<br>--Unit count | | | | | 96-7 (5)<br>34 (6)/<br>CT (1) | | | |
| | --Formula | | | | | | 117 (6) | | |
| | Distance<br>--Formula | | | | | | 137-9 (10) | | |
| | Line segments | | | | | 82 (4)<br>29 (10)/<br>CT (1) | | | |
| 4. | Determine area<br>Parallelograms<br>--Unit count | | | | | 99 (1) | | | |
| | --Formula | | | | | 35 (1)/<br>CT (1) | | | |
| | Rectangles<br>--Unit count | | | | | 98 (4)<br>35 (1) | | | |
| | --Formula | | | | | 98 (4)<br>35 (4)/<br>CT (1) | 117 (2) | | |
| | Surface areas of space figures<br>--Unit count | | | | | | | | |
| | --Formula | | | | | | | | |
| | Triangles<br>--Unit count | | | | | | 117 (2) | | |
| | --Formula | | | | | | | | |
| 5. | Determine volume<br>Rectangular prisms<br>--Unit count | | | | | | | | |
| | --Formula | | | | | | | | |
| 6. | Determine size of angles<br>--Unit count (protractor) | | | | | 88-91 (10)<br>31 (8)/<br>CT (1) | | | |

LMS MATH

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|---|---|---|---|---|---|---|---|---|---|
| XIX. | GEOMETRY | | | | | | | | |
| 1. | Recognize basic concepts | | | | | | | | |
| | Points | | | | | 76-7 (1)<br>27 (1)/<br>CT(1) | | | |
| | --Sets of points | | | | | | | | |
| | Rays | | | | | 77-8,84 (10)<br>27 (1)/<br>CT(1) | | | |
| | Lines | | | | | 78 (3)<br>27 (1)<br>94-5 (7)/<br>CT(1) | | | |
| | --Parallel | | | | | | | | |
| | --Perpendicular | | | | | 94-5 (2)/<br>CT(1) | | | |
| | Segments | | | | | 78-80 (10)<br>27 (1)/<br>CT(1) | | | |
| | --Congruent | | | | | 80-1 (10)<br>28 (5)/<br>CT(2) | | | |
| | --Bisecting | | | | | 93 (2)<br>84-5 (10)<br>30 (10)/<br>CT(2) | | | |
| | Angles | | | | | | | | |
| | --Congruent/incongruent | | | | | 86-7 (5)<br>30 (7)/<br>CT(1) | | | |
| | Plane | | | | | 77 (2)/<br>CT(1) | | | |
| 2. | Identify geometric shapes | | | | | | | | |
| | Triangles | | | | | | | | |
| | --Congruent | | | | | | | | |
| | Square | | | | | 95 (4)/<br>CT(1) | | | |
| | Rectangle | | | | | 95 (4)<br>35 (1)/<br>CT(1) | | | |

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|---|---|---|---|---|---|---|---|---|---|
| | Rhombus | | | | | 95(2)/<br>CT(1) | | | |
| | Trapezoid | | | | | | | | |
| | Circles | | | | | 92(3) | | | |
| | Parallelogram | | | | | 95(4)/<br>CT(1) | | | |
| | Polygons | | | | | 96-7(10)/<br>CT(1) | 117(6) | | |
| | --Perimeter | | | | | 96-7(10)/<br>CT(1) | 117(6) | | |
| | Quadrilaterals | | | | | 95(10)/<br>CT(1) | | | |
| 3. | Identify space figures | | | | | | | | |
| | Prisms | | | | | | | | |
| | --Rectangular | | | | | | | | |
| | --Square | | | | | | | | |
| | --Triangular | | | | | | | | |
| | Pyramid | | | | | | | | |
| | --Hexagonal | | | | | | | | |
| | --Rectangular | | | | | | | | |
| | Spheres | | | | | | | | |
| | --Hemisphere | | | | | | | | |
| | Cylinder | | | | | | | | |
| | Cube | | | | | | | | |
| | Cone | | | | | | | | |
| | --Truncated | | | | | | | | |
| | Torus | | | | | | | | |
| 4. | Construct or copy geometric figures | | | | | | | | |
| | Line segments | | | | | 92(1)<br>27(1)<br>93(1) | | | |
| | --Bisector | | | | | 92(1)<br>32(1)<br>93(1) | | | |
| | Angle | | | | | 32(2) | | | |
| | --Bisector | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Circles | | | | | 92(1) | | | |
| Lines | | | | | 94(2) | | | |
| --Parallel | | | | | 27(1)<br>94(1) | | | |
| --Perpendicular | | | | | 33(2)<br>94(1) | | | |
| Triangles | | | | | 33(6) | | | |
| Cube | | | | | | | | |
| Cylinder | | | | | | | | |
| Prism | | | | | | | | |
| Pyramid | | | | | | | | |
| Sphere | | | | | | | | |
| Cone | | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | | |
| 1. Identify different kinds of graphs | | | | | | | | |
| Bar graphs | | | | | | 110,119,<br>159(1) | | |
| Circle graphs | | | | | | 110,119,<br>159(0) | | |
| Line graphs | | | | | | | | |
| 2. Interpret data categorized on charts | | | | | | 111(5) | | |
| 3. Graph sets of numbers on a number line | | | | | | | | |
| Whole numbers | | | | | | | | |
| Rational numbers | | | | | | | | |
| 4. Identify the components of a graph on a number plane | | | | | | | | |
| Axes | | | | | | | | |
| Coordinates | | | | | | | | |
| 5. Graph sets of numbers on a number plane | | | | | | | | |
| Number pairs | | | | | | | | |
| Function rules | | | | | | | | |
| Integers | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 6. Calculate the distance of two points on a map drawn to scale | | | | | | | | |
| 7. Draw an object to a given scale | | | | | | | | |
| XXI. SPECIAL TOPICS | | | | | | | | |
| 1. Recognize concepts related to functions | | | | | | | | |
| Function rules | | 18-21(10)<br>7-8,11(10)/CT(3) | | | | | | |
| Number pairs | | 38-9(10)<br>7-8(10)/CT(3) | | | | | | 176-7(10)<br>61-2(10)/CT(6) |
| --Addition | | 20-1(10)<br>7(10)/CT(2) | | | | | | |
| --Repeated | | 22(10)<br>8(6)/CT(1) | | | | | | |
| --Subtraction | | 26-7(10)<br>10-1(10) | | | | | | |
| --Repeated | | 28(10) | | | | | | |
| --Multiplication | | 23-5(10)<br>8(10)/CT(2) | | | | | | |
| --Division | | 29-30(10)/CT(1) | | | | | | |
| 2. Recognize modular numbers | | | | | | | | |
| 3. Use algorithms on modular numbers | | | | | | | | |
| For Addition | | | | | | | | |
| --12-clock | | | | | | | | |
| ---4-clock | | | | | | | | |
| For Subtraction | | | | | | | | |
| --12-clock | | | | | | | | |
| ---4-clock | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| For Multiplication<br>--12-clock<br>---4-clock | | | | | | | | |
| CHAPTER REVIEWS | 16-7 (10)<br>6 (10) | 44-5 (10)<br>15 (10) | 64-5 (10)<br>22 (10) | 75 (10)<br>26 (10) | 101 (10)<br>36 (10) | 158-9 (10)<br>54 (10) | 174-5 (10)<br>60 (10) | 204-5 (10)<br>70 (10) |
| CUMULATIVE REVIEWS<br>("Keeping in Touch") | | 42 (10) | 63 (10) | 75 (10) | 100 (10) | 156 (10) | 172-3 (10) | 202-3 (10) |

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|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | |
| 1. Recognize set of points and numbers | | | | | | | |
| Sets of points | | | | | | 306-12 (10)<br>105-7 (10)/<br>CT (10) | |
| Sets of number pairs | | | | | | | |
| Sets of equivalent fractions | | | | | | | |
| Sets of solutions | | | | | | | |
| 2. Identify operations on sets | | | | | | | |
| Union | | | | | | | |
| Intersection | | | | | | | |
| 3. Relate sets and regions to rational numbers | | | | | 290-1 (10)<br>99 (10)/CT (1) | | |
| "And", "or" and "not" statements (reasoning) | | | | | | | |
| II. PLACE VALUE | | | | | | | |
| 1. Read and write numerals | | | | | | | |
| Thousands | | | | | | | |
| Millions | | | | | | | |
| Billions to Quintillions | | | | | | | |
| 2. Identify place values of digits in numerals | | | | | | | |
| Whole numbers | | | | | | | |
| Decimal numbers | | | 257 (10)<br>87 (2)/CT (0) | | | | |
| 3. Recognize numerals in different bases | | | | | | | |
| Base-10 numerals | | | | | | | |
| Base-4 numerals | | | | | | | |
| 4. Represent numerals in expanded form | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 5. Write numerals using different notations<br>Exponential notation<br>Decimal notation | | | 256-60(10)<br>87(10)/ CT (10) | | | | |
| 6. Represent numbers by concrete models<br>Abacus<br>Base ten machine | | | | | | | |
| III. OPERATIONS<br>1. Add-subtract with rational numbers | (See XI-2) | | | | | | |
| 2. Multiply-divide with rational numbers | (See XI-2) | | | | | | |
| 3. Perform operations on base-4 numerals | (See XI-4) | | | | | | |
| IV. SEQUENCES<br>1. Recognize and complete sequences involving whole numbers on a set of number lines<br>Rational numbers | 211(10) | 238(0)<br>77(8) | | | | | |
| --Rational numbers on a number line | 208-9(10)<br>71-2(10)/CT (8) | | | | | | |
| Odd and even numbers | | | | | | | |
| V. INEQUALITIES<br>1. Recognize and use relational symbols <, >, =, ≠ | | | | | | | |
| 2. Solve number phrases or sentences involving<br>Whole numbers<br>Rational numbers<br>Graphing<br>Solution sets | (See XII-3) | | | | | 304-5(10) | |

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|---|---|---|---|---|---|---|---|---|
| VI. | NOTATION | | | | | | | |
| 1. | Recognize symbols related to | | | | | | | |
| | Ancient numberals | | | | | | | |
| | --East Arabic numerals | | | | | | | |
| | --Egyptian numerals | | | | | | | |
| | --Greek numerals | | | | | | | |
| | --Roman numerals | | | | | | | |
| | Hindu-Arabic numerals | | | | | | | |
| | --Whole numbers | | | | | | | |
| | --Rational numbers | | | | | | | |
| | --Fractions | 206-9(10)<br>71-4(10)/<br>CT(10) | | | | | | |
| | --Decimals | | | 256-7(10)<br>87(10)/<br>CT(10) | | | | |
| | Functions | | | | | | | |
| | --f(n) | | | | | | | |
| | Sets | | | | | | | |
| | -- ∩ | | | | | | | |
| | -- ∪ | | | | | | | |
| | Geometry | | | | | | | |
| | -- $^{o}$ (degree) | | | | | | | |
| | -- ≅ | | | | 272(6)<br>91(10)/<br>CT(3) | | | |
| | -- ⟷, ⟶, ⟶ | | | | | | | |
| | -- | | | | | | | |
| | Variables | | | | | | | |
| | --a,b,c-- | | | | | | | |
| | Inequalities | | | | | | | |
| | <, >, =, ≠ | (See V-1) | | | | | | |
| VII. | NUMBER FACTS | | | | | | | |
| 1. | Recognize related terms | | | | | | | |
| | Addend | | | | | | | |
| | --Missing addend | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| | Sum | | | | | | | |
| | Difference | | | | | | | |
| | Factor | | | | | | | |
| | --Missing factor | | | | | | | |
| | Product | | | | | | | |
| | Quotient | | | | | | | |
| | Divisor | | | | | | | |
| 2. | Recall basic operation facts | | | | | | | |
| | Addition | | | | | | | |
| | --Repeated addition | | | | | | | |
| | Subtraction | | | | | | | |
| | --Repeated subtraction | | | | | | | |
| | Multiplication | | | | | | | |
| | --Multiples of 10, 100, and 1000 | | | | | | | |
| | --Special products | | | | | | | |
| | --Products | | | | | | | |
| | Division | | | | | | | |
| | --Zero in division | | | | | | | |
| | --Special quotients | | | | | | | |
| VIII. | EQUATIONS AND SOLUTIONS | | | | | | | |
| 1. | Determine solutions to equations | | | | | | | |
| | Multiplication and addition of whole numbers | | | | | | | |
| | Multiplication of whole numbers (special products) | (See VII-2) | | | | | | |
| | Multiplication and division of whole numbers (special quotients) | (See VII-2) | | | | | | |
| | Addition of rational numbers | (See XI-2) | 248(10)<br>77-84(10)/<br>CT(10) | | | | | |
| | a,b,c---variables | (See VI-1) | | | | | | |
| 2. | Find a set of solutions to several related equations | | | | | | | |

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|---|---|---|---|---|---|---|---|
| IX. NUMBER LINE | | | | | | | |
| 1. Use the number line to represent numbers | | | | | | | |
| Whole numbers<br>Rational numbers | 206-9,213-5 (10)<br>71-2(10)/ CT(9) | 242-3(10)<br>77(2)/CT(1) | | | | | |
| 2. Use the number line to represent operations | | | | | | | |
| Estimation of whole numbers | | | | | | | |
| Addition-subtraction of rational numbers | | 226,230(10)<br>77(2)/CT(1) | | | | | |
| Multiplication of rational numbers | | | | | 292-3(10)<br>100(3)/ CT(1) | | |
| Graphing | | | | | | 304-5,310 (10)<br>105-7(10)/ CT(10) | |
| X. BASIC PRINCIPLES | | | | | | | |
| 1. Recognize basic principles of mathematical operations | | | | | | | |
| Associative principle | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of rational numbers | | 246(6) | | | | | |
| --Addition of modular numbers | | | | | | | 320(3)<br>110(1) |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of rational numbers | | | | | 294(0)/CT (1) | | |
| --Multiplication of modular numbers | | | | | | | 320(1) |

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|---|---|---|---|---|---|---|---|
| Commutative principle | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of rational numbers | | 246 (8) | | | | | |
| --Addition of modular numbers | | | | | | | 320 (2)<br>110 (1)/<br>CT (1) |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of rational numbers | | | | | 294 (0)<br>101 (6)/<br>CT (1) | | |
| --Multiplication of modular numbers | | | | | | | 320 (2) |
| Distributive principle | | | | | | | |
| --Multiplication of whole numbers | | | | | | | 320 (3) |
| --Multiplication of modular numbers | | | | | | | 320 (2) |
| One principle | | | | | | | |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of rational numbers | | | | | 294 (0)<br>101 (10) | | |
| --Multiplication of modular numbers | | | | | | | 320 (1) |
| Zero principle | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of rational numbers | | 246 (10)<br>77 (1) | | | | | |
| --Addition of modular numbers | | | | | | | 320 (4) |
| XI. PROCESSES (ALGORITHMS) | | | | | | | |
| 1. Use algorithms for operations on whole numbers | | | | | | | |
| Addition-subtraction | | | | | | | |
| --1, 2, 3, 4-digit numbers | | | | | | | |
| --By regrouping | | | | | | | |

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| --More than two addends | | | | | | | |
| --Involving money | | | | | | | |
| Multiplication | | | | | | | |
| --2, 3, 4-digit by 1-digit factors | | | | | | | |
| --3, 4-digit by 2-digit factors | | | | | | | |
| --3, 4-digit by 3-digit factors | | | | | | | |
| --Involving money | | | | | | | |
| Division | | | | | | | |
| --1-digit divisors and 2-3-digit quotients --Short form | | | | | | | |
| --2-digit multiple of ten and 1-digit quotients | | | | | | | |
| --2-digit divisors and 1-digit quotients | | | | | | | |
| --2-digit multiple of ten and 2-digit quotients | | | | | | | |
| --2-digit divisors and 2-digit quotients --Short form | | | | | | | |
| --2-digit divisors and 3-digit quotients --Zero in the quotient | | | | | | | |
| --Involving money | | | | | | | |
| 2. Use algorithms for operations on rational numbers | (See XII-4) | | | | | | |
| 3. Use algorithms for operations on modular numbers | (See XXI-3) | | | | | | |
| 12-clock | | | | | | | |
| 4-clock | | | | | | | |
| XII. RATIONAL NUMBERS | | | | | | | |
| 1. Recognize related terms | | | | | | | |
| Fractions | | | | | | | |
| --Numerator | | | | | | | |
| --Denominator | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| | Decimals<br>--Decimal notation | | | 256-60(10)<br>87(10)/<br>CT(10) | | | | |
| 2. | Write numerals for rational numbers | | | 242(10)<br>77(8) | | | | |
| | Fractions | 206-9(10)<br>71-2(10)/<br>CT(10) | | | | | | |
| | --Equivalent fractions | 210-1(10)<br>71,73(10)/<br>CT(3) | | | | | | |
| | --Lower, higher and lowest terms<br>--Checking | | | | | | | |
| | --Improper fractions | 214(10)<br>75(10)/CT(3) | 244(10)<br>77(6) | | | | | |
| | --Mixed numerals | | 244(10)<br>82(10)/<br>CT(2) | | | | | |
| | --Ratio | (See XIII-1) | | | | | | |
| | Decimals | | | 256-60(10)<br>87(10)/<br>CT(10) | | | | |
| 3. | Relate rational numbers to sets and regions | (See I-3) | | | | | | |
| 4. | Use rational numbers in | | | | | | | |
| | Measurement | 220-1(10) | | | | | | |
| | Inequalities | 212-3(10)<br>74-5(10)/<br>CT(4) | | | | | | |
| | Graphing | | | | | | 304-5(10)<br>105(5)/<br>CT(7) | |
| 5. | Perform operations on rational numbers in fraction form | | | | | | | |
| | Addition-subtraction | | | | | | | |

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|---|---|---|---|---|---|---|---|
| --Fractions less than 1, similar denominators | | 226-7(10)<br>77(10)/<br>CT(2) | | | | | |
| --Fractions less than 1, different denominators | | 228-35(10)<br>78-9(10)/<br>CT(5) | | | | | |
| --Using least common denominator algorithm | | 238-40(10)<br>80-1(10)/<br>CT(3) | | | | | |
| --Fractions more than 1 | | 247-50(10)<br>83-4(10)/<br>CT(5) | | | | | |
| Multiplication<br>--Fractions less than 1 | | | | | 291-7(10)<br>99,102(8)/<br>CT(5) | | |
| --Fractions less than 1 by whole numbers | | | | | 292-3,295<br>(10)<br>100-2(10)/<br>CT(4) | | |
| Division<br>--Fractions less than 1 | | | | | 298(10)<br>103(10)/<br>CT(4) | | |
| --Related to multiplication | | | | | 298(10)<br>103(10)/<br>CT(2) | | |
| 6. Add-subtract rational numbers in decimal form | | | | | | | |
| --1, 2-place decimals less than 1 | | | 261(10)<br>88(7)/CT(1) | | | | |
| --1, 2-place decimals more than 1 | | | 262-3(10)<br>88(10)/<br>CT(4) | | | | |
| --Involving money | | | 264(10)<br>89(10)/<br>CT(1) | | | | |
| --Involving metric units | | | 266-7(10) | | | | |

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| XIII. | RATIO AND PROPORTION | | | | | | | |
| 1. | Use ratio to compare the measure of two objects | 218-9(10) | | | | | | |
| 2. | Calculate the distance between two cities on a map drawn to scale | 219(8) | | | | | | |
| 3. | Draw an object to a specified scale | 219(1) | | | | | | |
| XIV. | PROBLEM SOLVING | | | | | | | |
| 1. | Solve word problems involving | | | | | | | |
| | Time, weight, distance, etc. | | | | | | | |
| | Averages | | | | | | | |
| | Operations on numbers | | | | | | | |
| | Measurement | | | | | | | |
| | Geography and population | | 253(10) | | | | | |
| | Planets | | | | | | | |
| | Airplanes and travel | | | | | | | |
| | The Pentagon | | | | | | | |
| | Temperature | | 237(10)<br>85(1) | | | | | |
| | Short stories | 216(10)<br>75(10) | 241,251 (10)<br>85(10)/CT(2) | | | 300(10)<br>100,103 (10)/CT(2) | | |
| | Decimal numbers | | | 265(10)<br>89(7)/CT(2) | | | | |
| | Estimation | | | | | | | |
| 2. | Write a problem about a given picture | | | | | | | |
| XV. | LOGIC | | | | | | | |
| 1. | Find a set of solutions implied from related equations | | | | | | | |

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| 2. Make mathematical statements involving<br>Deduction, "and" "or"<br>Negation, "not" | | | | | | | |
| 3. Solve reasoning problems involving<br>Operations<br>Sets<br>Weights | | | | | | | |
| XVI. NUMBER THEORY<br>1. Recognize special sets of numbers<br>Odd and even numbers<br>Factors<br>--Common factors<br>--Greatest common factor<br>--Factor trees<br>Prime numbers<br>Multiples<br>--Least common multiple<br>--Least common denominator<br>Equivalent fractions<br>--Lowest terms<br>Modular numbers<br>--12-clock<br>--4-clock | (See XII-2)<br>(See XXI-2) | 239(4)<br>80(2)<br>238-9(10)<br>80(2) | | | | | |
| XVII. ESTIMATION<br>1. Use estimation to perform Mathematical operations on whole numbers<br>--Quotients and products<br>--Multiples of 10, 100<br>--Sums and differences | | | | | | | |

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| Mathematical operations on rational numbers | | | | | | | |
| Measurement | | | | | | | |
| XVIII. MEASURMENT | | | | | | | |
| 1. Recognize and use units of measurement | | | | | | | |
| Metric units | | | 266-7(10) | | | | |
| --Centimeter | | | 266-7(10) | | | | |
| Inch | | | | | | | |
| Foot | | | | | | | |
| Degree | | | | | | | |
| Radian | | | | | | | |
| 2. Use measuring instruments | | | | | | | |
| Ruler | 220-1(10) | | | | | | |
| Protractor | | | | | | | |
| Compass | | | | | | | |
| 3. Determine lengths | 220-1(10)<br>82-3 | | | | | | |
| Perimeter of polygons | | | | | | | |
| --Unit count | | | | | | | |
| --Formula | | | | | | | |
| Distance | | | | | | | |
| --Formula | | | | | | | |
| Line segments | | | | | | | |
| 4. Determine area | | | | | | | |
| Parallelograms | | | | | | | |
| --Unit count | | | | | | | |
| --Formula | | | | | | | |
| Rectangles | | | | | | | |
| --Unit count | | | | | | | |
| --Formula | | | | | | | |
| Surface areas of space figures | | | | | | | |
| --Unit count | | | | 284-5(10)<br>97(10)/<br>CT(2) | | | |

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| | --Formula | | | | 286-7(10)/<br>CT(1) | | | |
| | Triangles<br>--Unit count | | | | 276-7(10)<br>93(8)/<br>CT(3) | | | |
| | --Formula | | | | 276-7(10)<br>93(6)/<br>CT(1) | | | |
| 5. | Determine volume<br>Rectangular prisms<br>--Unit count | | | | 282(6)<br>96-7(10)/<br>CT(3) | | | |
| | --Formula | | | | 282-3(8)<br>96(2)/<br>CT(3) | | | |
| 6. | Determine size of angles<br>--Unit count (protractor) | | | | | | | |
| XIX. | GEOMETRY | | | | | | | |
| 1. | Recognize basic concepts<br>Points<br>--Sets of points | | | | | | 306-12(10) | |
| | Rays<br>Lines<br>--Parallel<br>--Perpendicular<br>Segments<br>--Congruent<br>--Bisecting<br>Angles<br>--Congruent/incongruent<br>Plane | | | | 278(0) | | | |
| 2. | Identify geometric shapes<br>Triangles | | | | 276(10)<br>91(10)/<br>CT(2) | | | |

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|---|---|---|---|---|---|---|---|---|
| | --Congruent | | | | 272(10)<br>91(10)/<br>CT(2) | | | |
| | Square | | | | | | | |
| | Rectangle | | | | | | | |
| | Rhombus | | | | | | | |
| | Trapezoid | | | | | | | |
| | Circles | | | | | | | |
| | Parallelogram | | | | | | | |
| | Polygons | | | | | | | |
| | --Perimeter | | | | | | | |
| | Quadrilaterals | | | | | | | |
| 3. | Identify space figures | | | | | | | |
| | Prisms | | | | | | | |
| | --Rectangular | | | | 278(1)/<br>CT(1) | | | |
| | --Square | | | | 279(1) | | | |
| | --Triangular | | | | 279(1) | | | |
| | Pyramid | | | | | | | |
| | --Hexagonal | | | | 279(1) | | | |
| | --Rectangular | | | | 278(1)/<br>CT(3) | | | |
| | Spheres | | | | | | | |
| | --Hemisphere | | | | 279(1)/<br>CT(3) | | | |
| | Cylinder | | | | 278(1)/<br>CT(3) | | | |
| | Cube | | | | 279(1) | | | |
| | Cone | | | | 278(1)/<br>CT(2) | | | |
| | --Truncated | | | | 279(1) | | | |
| | Torus | | | | 279(1) | | | |
| 4. | Construct or copy geometric figures | | | | | | | |
| | Line segments | | | | | | | |
| | --Bisector | | | | | | | |
| | Angle | | | | | | | |
| | --Bisector | | | | | | | |

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|---|---|---|---|---|---|---|---|
| Circles | | | | | | | |
| Lines | | | | | | | |
| --Parallel | | | | | | | |
| --Perpendicular | | | | | | | |
| Triangles | | | | 274-5(6)/<br>CT(2) | | | |
| Cube | | | | 94(1) | | | |
| Cylinder | | | | 94(1) | | | |
| Prism | | | | 94(1) | | | |
| Pyramid | | | | 95(2) | | | |
| Sphere | | | | 95(2) | | | |
| Cone | | | | 95(2) | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | |
| 1. Identify different kinds of graphs | | | | | | | |
| Bar graphs | | | | | | | |
| Circle graphs | | | | | | | |
| Line graphs | | 237(1)<br>77(2)/CT(1) | | | | | |
| 2. Interpret data catagorized on charts | | 253,255(5) | | | | | |
| 3. Graph sets of numbers on a number line | | | | | | | |
| Whole numbers | | | | | | 304(4)<br>105(3)/<br>CT(1) | |
| Rational numbers | | | | | | 304-5(4)<br>105(5)/<br>CT(7) | |
| 4. Identify the components of a graph on a number plane | | | | | | | |
| Axes | | | | | | 306-12(10)<br>107(10) | |

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| Coordinates | | | | | | 306-12(10)<br>107(2)/<br>CT(2) | |
| 5. Graph sets of numbers on a number plane | | | | | | | |
| Number pairs | | | | | | 306-7(10)<br>106(10)/<br>CT(6) | |
| Function rules | | | | | | 308-9,312<br>(10)<br>107(10) | |
| Integers | | | | | | 310-3(10)<br>107(10)/<br>CT(6) | |
| 6. Calculate the distance of two points on a map drawn to scale | 218(8) | | | | | | |
| 7. Draw an object to a given scale | 218(1) | | | | | | |
| XXI. SPECIAL TOPICS | | | | | | | |
| 1. Recognize concepts related to functions | | | | | | | |
| Function rules | | | | | | | |
| Number pairs | | | | | | | |
| --Addition | | | | | | | |
| --Repeated | | | | | | | |
| --Subtraction | | | | | | | |
| --Repeated | | | | | | | |
| --Multiplication | | | | | 299(10)/<br>CT(2) | | |
| --Division | | | | | | | |
| 2. Recognize modular numbers | | | | | | | 314-7(10)<br>109(10)/<br>CT(10) |

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|---|---|---|---|---|---|---|---|
| 3. Use algorithms on modular numbers | | | | | | | |
| For addition | | | | | | | |
| --12-clock | | | | | | | 314-5(10)<br>109(7)/<br>CT(7) |
| ---4-clock | | | | | | | 318-9(10)<br>110(10)/<br>CT(3) |
| For subtraction | | | | | | | |
| --12-clock | | | | | | | 316-7(10)<br>109(7)/<br>CT(3) |
| ---4-clock | | | | | | | 319(10)/<br>CT(1) |
| For multiplication | | | | | | | |
| --12-clock | | | | | | | 317(10)<br>109(3)/<br>CT(3) |
| ---4-clock | | | | | | | 319(10) |
| CHAPTER REVIEWS | 224-5(10)<br>76(10) | 254-5(10)<br>86(10) | 270(10)<br>90(10) | 289(10)<br>98(10) | 301(10)<br>104(10) | 313(10)<br>108(10) | 321(10)<br>111(10) |
| CUMULATIVE REVIEWS ("Keeping in Touch") | 222-3(10) | 252-3(10) | 268(10) | 288-9(10) | 302-3(10) | | 322-3(10) |

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| I. SET CONCEPTS | | | | | | | |
| 1. Identify special sets<br>Empty set | | | | | | | |
| 2. Recognize and relate concept of set to<br>Ordered pairs<br>Fractions<br>Equivalent fractions | | | | | | | |
| 3. Identify operations on sets<br>Union<br>Intersection | | | | | | | |
| II. PLACE VALUE | | | | | | | |
| 1. Identify place value names and place value positions up to<br>12th place (whole numbers)<br>3rd place (decimals) | (See XII-6) | 217(8) | | | | | |
| 2. Place whole numbers in expanded notation or compact form | | | | | | | |
| 3. Solve expanded numeral equations by identifying the missing digits | | 219(3) | | | | | |
| 4. Solve place value problems by use of<br>Abacus<br>Computer model | | | | | | | |
| 5. Code and decode place value problems base 10 with other number systems<br>Tally system<br>Base 4<br>Base 6<br>Base 8 | (See XXI-3)<br>(See XXI-3)<br>(See XXI-3) | | | | | | |
| III. OPERATIONS | (See Processes) | | | | | | |

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| IV. SEQUENCES | | | | | | | |
| 1. Identify or construct sequences | | | | | | | |
| Number patterns | | | | | | | |
| Fractional numbers | (See XII-4) | | | | | | |
| Repeating decimals | (See XII-9) | | | | | | |
| V. INEQUALITIES | | | | | | | |
| 1. Compare numbers | | | | | | | |
| Whole numbers | | | | | | | |
| Fractions | (See XII-2) | | | | 298(9) | | |
| Decimals | (See XII-7) | | | | | | |
| 2. Compare products and factors | | | | | | | |
| VI. NOTATION | | | | | | | |
| 1. Code and decode expressions with exponents | | | | | | | |
| Base 10 | | 245(9) | | | | | |
| Base 10 scientific notation | | 245(5) | | | | | |
| Bases other than 10 | | | | | | | |
| 2. Determine opposites of whole numbers | (See XXI-5) | | | | | | |
| VII. NUMBER FACTS | | | | | | | |
| 1. Recall number facts in use of functions | | | | | | | |
| Addition | | | | | | | |
| Subtraction | | | | | | | |
| Multiplication | | | | | | | |
| Division | | | | | | | |
| VIII. EQUATIONS AND SOLUTIONS | | | | | | | |
| 1. Solve equations using variables a,b,c... | | | | | | | |
| 2. Solve equations finding missing | | | | | | | |
| Addend | | | | | | | |
| Factor | | | | | | | |

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| 3. Solve equations with operations | | | | | | | |
| Addition and subtraction | | | | | | | |
| Multiplication and division | | | | | | | |
| 4. Write equations using whole numbers | | | | | | | |
| 5. Solve equations using % | | | | 284-5(10) | | | |
| IX. NUMBER LINE | | | | | | | |
| 1. Perform operations using a number line | | | | | | | |
| Addition | | | | | | | |
| --Whole numbers | | | | | | | |
| --Fractions | (See XII-1) | | | | | | |
| --Integers | (See XXI-7) | | | | | | |
| Subtraction | | | | | | | |
| --Whole numbers | | | | | | | |
| --Fractions | (See XII-1) | | | | | | |
| Multiplication | | | | | | | |
| --Fractions | (See XII-1) | | | | | | |
| 2. Identify points on number line with | | | | | | | |
| Fractions | (See XII-1) | | | | | | |
| Decimals | (See XII-8) | | | | | | |
| 3. Relate labeled points on number line with specified jumping operations | | | | | | | |
| 4. Graph sets of points on the number line | | | | | | 303(10) | |
| X. BASIC PRINCIPLES | | | | | | | |
| 1. Recognize basic principles of mathematical operations | | | | | | | |
| Associative principle | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of fractions | (See XII-3) | | | | | | |
| --Addition of integers | (See XXI-6) | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | |

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| Commutative principle – | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of fractions | (See XII-3) | | | | | | |
| --Addition of integers | (See XXI-6) | | | | | | |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | |
| Distributive principle | | | | | | | |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | |
| One principle | | | | | | | |
| --Multiplication of whole numbers | | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | |
| Zero principle | | | | | | | |
| --Addition of whole numbers | | | | | | | |
| --Addition of fractions | (See XII-3) | | | | | | |
| --Addition of integers | (See XXI-6) | | | | | | |
| XI. PROCESSESS (ALGORITHMS) | | | | | | | |
| 1. Use algorithms for addition of | | | | | | | |
| Whole numbers (renaming) | | | | | | | |
| --1-2 digit numerals | | | | | | | |
| --3-digit numerals | | | | | | | |
| --4-digit numerals | | | | | | | |
| Fractions | (See XII-5) | | | | | | |
| --Equivalent fractions | | | | | | | |
| --Mixed numerals and improper fractions | | | | | | | |
| Decimals | (See XII-10) | | | | | | |
| --1-decimal digit | | | | | | | |
| --2-decimal digits | | | | | | | |
| --3-decimal digits | | | | | | | |
| Integers | (See XXI-7) | | | | | | |
| --1-digit numerals | | | | | | | |
| 2. Use algorithms for subtraction of | | | | | | | |
| Whole numbers (renaming) | | | | | | | |
| --1-2 digit numerals | | | | | | | |

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| --3-digit numerals<br>--4-digit numerals<br>Fractions<br>--Equivalent fractions<br>Decimals<br>--1-decimal digit<br>--2-decimal digits<br>--3-decimal digits<br>Integers<br>--1-digit numerals | (See XII-5)<br>(See XII-10)<br>(See XXI-7) | | | | | | |
| 3. Use algorithms for multiplication of<br>Whole numbers<br>--One factor of 1-2-digits<br>--One factor of 3-digits<br>--One factor of 4-digits or more<br>--Two factors of 2-digits each<br>--Two factors of 3-digits each<br>Fractions<br>--Two factors in fractional form<br>--Two factors in mixed numeral form<br>Decimals<br>--One factor of 1-decimal digit<br>--One factors of 2-decimal digits<br>Integers<br>--1-digit numerals | (See XII-5)<br>(See XII-10) | | | | | | |
| 4. Use algorithms for division of<br>Whole numbers<br>--1-digit divisors<br>--2-digit divisors | | | | | | | |

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| --Check division | | | | | | | |
| --Remainders in division | | | | | | | |
| --Zeros in quotient | | | | | | | |
| Fractions (See XII-5) | | | | | | | |
| --Associate improper fractions with mixed numerals | | | | | | | |
| --Determine reciprocal of fractions | | | | | | | |
| --Determine the quotient of two rational numbers | | | | | | | |
| Decimals (See XII-10) | | | | | | | |
| --Whole number divisor | | | | | | | |
| --1-decimal dividend | | | | | | | |
| --2-decimal dividend | | | | | | | |
| --3-decimal dividend | | | | | | | |
| --Decimal divisor | | | | | | | |
| --1-decimal digit | | | | | | | |
| --2-decimal digits | | | | | | | |
| --3-decimal digits | | | | | | | |
| XII. RATIONAL NUMBERS | | | | | | | |
| 1. Recognize and relate properties of fractions | | | | | | | |
| Identify related properties of fractions | | | | | | | |
| --Sets of equivalent fractions (See I-2) | | | | | | | |
| --Fractions in lowest form | | | | | | | |
| --Least common denominators | | | | | | | |
| Relate fractions to | | | | | | | |
| --Regions | | | | | | | |
| --Rational numbers | | | | | | | |
| --Names for rational numbers | | | | | | | |
| --Whole numbers | | | | | | | |
| --Mixed numerals | | | | | | | |
| --Number line | | | | | | | |
| 2. Compare two fractions | | | | | | | |
| Equalities | | | | | | | |
| Inequalities | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 3. Recognize and use basic principles for operations with fractions | | | | | | | |
| Commutative principle (addition) | | | | | | | |
| Associative principle (addition) | | | | | | | |
| Identity principle (addition) | | | | | | | |
| Commutative principle (multiplication) | | | | | | | |
| Associative principle (multiplication) | | | | | | | |
| Identity principle (multiplication) | | | | | | | |
| Addition and multiplication principle (distributive) | | | | | | | |
| 4. Recognize sequences of fractions | | | | | | | |
| 5. Use algorithms for | | | | | | | |
| Addition of fractions | | | | | | | |
| --Equivalent fractions | | | | | | | |
| --Mixed numerals and improper fractions | | | | | | | |
| Subtraction of fractions | | | | | | | |
| Multiplication of fractions | | | | | | | |
| --Proper form | | | | | | | |
| --Improper form and mixed numerals | | | | | | | |
| --Reciprocals | | | | | | | |
| Division of fractions | | | | | | | |
| --Improper form and mixed numerals | | | | | | | |
| --Reciprocals | | | | | | | |
| --Quotient of two rational numbers | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 6. Identify place value names and place value positions with decimals | | | | | | | |
| --Up to 3-decimal places | | 217,228(10)<br>76(10)/CT (8) | | | | | |
| 7. Compare two decimals | | 221(10)<br>78(10) | | | | | |
| 8. Relate decimals to points on the number line | | 220(10) | | | | | |
| 9. Recognize sequences of repeating decimals | | 243(2) | | | | | |
| 10. Use algorithms for Addition of decimals | | | | | | | |
| --1-decimal digit | | 222(6)<br>79(10) | | | | | |
| --2-decimal digits | | 222(10)<br>79,88(10)/CT(1) | | | | | |
| --3-decimal digits | | 222(10)<br>79(8) | | | | | |
| Subtraction of decimals | | | | | | | |
| --1-decimal digit | | 222(1)<br>79(3) | | | | | |
| --2-decimal digits | | 222(5)<br>79,88(9)/CT(1) | | | | | |
| --3-decimal digits | | 222(4)<br>79(2) | | | | | |
| Multiplication of decimals | | | | | | | |
| --One factor of 1-decimal digit | | 232(10)<br>82-3(10)/CT(1) | | | | | |
| --One factor of 2-decimal digits | | 232(10)<br>82-3(10)/CT(3) | | | | | |

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|---|---|---|---|---|---|---|---|
| Division of decimals<br>--Whole number divisor<br>--1-decimal dividend | | 237(4)<br>84(1) | | | | | |
| --2-decimal dividend | | 237(2)<br>84(2)/CT(1) | | | | | |
| --3-decimal dividend | | 237(3)<br>84(3)/CT(1) | | | | | |
| --Decimal divisor<br>--1-decimal digit | | 239(7)<br>85(4) | | | | | |
| --2-decimal digits | | 239(8)<br>85(3)/CT(1) | | | | | |
| --3-decimal digits | | 239(2)<br>85(2) | | | | | |
| 11. Associate percent with rational numbers | | | | 273(10)<br>97,99(10)/CT(10) | | | |
| 12. Solve word problems with percent related to<br>Money | | | | 274-5(10)<br>98,101(8)/CT(5) | | | |
| Area | | | | 276(9)<br>98-9(6) | | | |
| Other | | | | 275,279,282-3(10)<br>98,100-1(8)/CT(3) | | | |
| XIII. RATIO AND PROPORTION<br>1. Identify equal ratios | 208(10)<br>72,75(10)/CT(8) | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. | Relate ratios to Measurement | 207,209(10)/CT(1) | | | | | | |
| | Expression of rate | 207(1) 71(4)/CT(2) | | | | | | |
| | Compare 2 sets according to the number of objects in each | 207,209(10) 71,75(10)/CT(5) | | | | | | |
| 3. | Relate ratios to length of sides of triangles | 210(6)/CT(4) | | | | | | |
| 4. | Use ratios in word problems | 209,211(10) 72,75(2)/CT(2) | | | | | | |
| XIV. | PROBLEM SOLVING | | | | | | | |
| 1. | Solve verbal problems involving multiple operations | | | | | | | |
| 2. | Solve verbal problems involving special topics | | | | | | | |
| | Places | | | | | | | |
| | --Washington, D.C. | | | | | | | |
| | --Cape Kennedy | | | | | | | |
| | --Egyptian pyramids | | | | | | | |
| | Animals | | | | | | | |
| | --Birds | | | | | | | |
| | --Horses | | | | | | | |
| | Machines | | | | | | | |
| | --Rockets | | | | | | | |
| | --Automobiles | | | | | | | |
| | Human body | | | | 287(10) | | | |
| | Falling bodies | | | 269(6) | | | | |
| | Density | | 225(6) | | | | | |
| | Averages, means | | | | | | | |
| | Interest and percent discount | | | | 281-2(10)/CT(9) | | | |

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|---|---|---|---|---|---|---|---|
| Rate, time, distance and money | | 87(3) | | | | | |
| Recipes, liquid measure | | | | | | | |
| Temperature | | 87(3)/CT(1) | | | | | |
| XV. LOGIC | | | | | | | |
| XVI. NUMBER THEORY | | | | | | | |
| 1. Identify factors of numbers | | | | | | | |
| 2. Identify numbers divisible by | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 5 | | | | | | | |
| 3. Identify factors trees | | | | | | | |
| 4. Identify least common multiple | | | | | | | |
| 5. Identify greatest common divisor | | | | | | | |
| 6. Identify prime numbers | | | | | | | |
| 7. Identify composite numbers | | | | | | | |
| 8. Determine prime factorization for given numbers | | | | | | | |
| 9. Solve problems using special sets of numbers | | | | | | | |
| 10. Solve equations using | | | | | | | |
| 12-clock arithmetic | | | | | | | |
| 5-clock arithmetic | | | | | | | |
| XVII. ESTIMATION | | | | | | | |
| 1. Estimate results of mathematical operations | | | | | | | |
| Multiplication | | 236(10) | | | | | |
| Division | | | | | | | |
| 2. Estimate | | | | | | | |
| Population | | | | | | | |
| Circumference of circle | | | 253(8)<br>90(4) | | | | |

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|---|---|---|---|---|---|---|---|
| Area of circle | | | 255(4)<br>91(3) | | | | |
| Miles, speed, cost<br>Length, thickness, width | | 241(7) | | | | | |
| 3. Estimate results in short stories | | | | | | | |
| 4. Compare numbers<br>Decimals with decimals or mixed numbers<br>Whole numbers with fractions | | 221(10)<br>78-88(10) | | | | | |
| 5. Round numbers to nearest whole number, tenth, or hundredth | | 229(7)<br>81(10)/CT(1) | | | | | |
| XVIII. MEASUREMENT<br>1. Recognize and use systems for linear measurement<br>Centimeter<br>Inch<br>Mile<br>Kilometer | | 87(2) | | | | | |
| 2. Measure circumference of circle | | | 252-3(7)<br>90(4)/CT(2) | | | | |
| 3. Measure perimeter of polygons | | | | | | | |
| 4. Measure length of sides of rectangles | | 227(6) | | | | | |
| 5. Determine length of sides of triangles or areas of squares using Pythagorean Theorem | | | | | | | |
| 6. Determine area of<br>Rectangles<br>Triangles<br>Circles<br><br>Surfaces | | 227(6) | 91(3)<br><br>254-5(10)<br>91,96(5)<br>264-8(10)<br>95,96(10)/CT(2) | | | | |

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|---|---|---|---|---|---|---|---|
| 7. Determine volume of rectangular prisms | | | 262-3(10) 95,96(9)/ CT(2) | | | | |
| 8. Determine measure of angles | | | | | | | |
| 9. Recognize and use indirect measure | 210,212(10) | | | | | | |
| 10. Measure circumference of circle to approximate pi (π) | | | 253(2)/ CT(7) | | | | |
| 11. Measure scale drawings | (See XX) | | | | | | |
| XIX. GEOMETRY | | | | | | | |
| 1. Recognize and construct basic figures | | | | | | | |
| Lines | | | | | | | |
| --Parallel | | | | | | | |
| --Perpendicular | | | | | | | |
| --Intersection | | | | | | | |
| Line segments | | | | | | | |
| Points | | | | | | | |
| Rays | | | | | | | |
| Angles | | | | | | | |
| --Right | | | | | | | |
| --Congruent | | | | | | | |
| --Bisected | | | | | | | |
| --Degree and radian measure | | | | | | | |
| 2. Construct geometric shapes and/or state relationships among various components | | | | | | | |
| Triangle | | | | | | | |
| --Construction | | | | | | | |
| --Congruent | | | | | | | |
| --Area | (See XVIII-6) | | | | | | |
| Right Triangle | (See XVIII-5) | | | | | | |
| --Pythagorean Theorem | (See XVIII-5) | | | | | | |
| --Ratios of sides | (See SVIII-9) | | | | | | |
| --Hypotenuse | (See XVIII-9) | | | | | | |

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|---|---|---|---|---|---|---|---|
| Polygons | | | | | | | |
| --Area of rectangles | (See XVIII-6) | | | | | | |
| --Similar | (See XVIII-9) | | | | | | |
| --Perimeter | (See XVIII-3, 4) | | | | | | |
| Circles | | | 251(0)/CT (2) | | | | |
| --Tangent, radius, diameter | | | | | | | |
| --Area | (See XVIII-6) | | | | | | |
| --Chord | | | 250(3) 89(1)/CT(1) | | | | |
| --Circumference | (See XVIII-2) | | | | | | |
| --Pi ($\pi$) | (See XVIII-10) | | | | | | |
| Protractor | | | | | | | |
| Closed curve | | | | | | | |
| 3. Construct space figures and/or state relationships among various components | | | | | | | |
| Cross sections | | | 261(3)/CT (1) | | | | |
| The 5 regular solids | | | 258(7) 94(10)/CT (1) | | | | |
| Cubes | | | 92(1) | | | | |
| --Faces | | | 258-9(2)/ CT(1) | | | | |
| --Edges | | | 259(5)/CT (1) | | | | |
| --Vertices | | | 259(3)/CT (2) | | | | |
| Surfaces area | (See XVIII-6) | | | | | | |
| Geometric planes | | | 256(1) | | | | |
| Sphere | | | 257(1) | | | | |
| Cylinder | | | 256-7(1) 92(1)/CT (1) | | | | |
| Cone | | | 257(1) 92(1) | | | | |
| Octahedron | | | 258,260(2) | | | | |

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|---|---|---|---|---|---|---|---|
| Prisms | | | | | | | |
| --Triangular | | | 257(1) | | | | |
| --Hexagonal | | | 260(1) | | | | |
| | | | 93(1) | | | | |
| --Rectangular | | | 257,262(10) | | | | |
| Pyramids | | | | | | | |
| --Square | | | 260(1) | | | | |
| --Rectangular | | | 257(1)/CT(1) | | | | |
| 4. Identify measures in geometric illusions | | | 266-7(8) | | | | |
| 5. Recognize and use concepts from coordinate geometry | (See XX-3) | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | |
| 1. Use maps and graphs as aids in solving verbal problems | | | | | | | |
| Bar graphs | | | | | | | |
| Circle graphs | | | | 283,289 (10) | | | |
| Charts | | 225(8) | | | | | |
| Pictographs | (See XIV-2) | | | | | | |
| Geographic maps | 74(6) | | | | | | |
| Line graphs | | | | | | | |
| Scale drawings | 212-3(10) | | | | | | |
| | 74(7) | | | | | | |
| 2. Use number line to graph sets of points | | | | | | 303(10) | |
| | | | | | | 106,109(9) | |
| | | | | | | /CT(9) | |
| 3. Use number plane to graph | | | | | | | |
| Whole number pairs | | | | | | 304(10) | |
| | | | | | | 107,109(10) | |
| | | | | | | /CT(10) | |
| Rational number pairs | | | | | | 305(10) | |
| | | | | | | 107,109(10) | |
| | | | | | | /CT(5) | |
| Functions | (See XXI-2) | | | | | | |

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| XXI. SPECIAL TOPICS | | | | | | | |
| 1. Use function rules to supply missing numbers<br>One function<br>Composite functions | | | | | | | |
| 2. Graph functions | | | | | | 306-8(10)<br>108(10)/<br>CT(4) | |
| 3. Name numbers in bases other than base 10<br>Base 4<br>Base 6<br>Base 8<br>Other bases | | | | | | | |
| 4. Solve verbal problems using integers | | | | | 290-1(10)/<br>CT(6) | | |
| 5. Determine opposites of whole numbers | | | | | 292(10)<br>102,105(10)<br>/CT(1) | | |
| 6. Recognize and use basic principles for addition of integers | | | | | 293(10)<br>102,105(6)/<br>CT(3) | | |
| 7. Perform operations on integers<br>Addition<br>Subtraction<br>Order | | | | | 294-7(10)<br>102-3(10)/<br>CT(10)<br>296-7(10)<br>104(10)/CT<br>(4)<br>298(10)<br>102(4) | | |
| 8. Perform experiments to determine probabilities of outcomes<br>Coins | | | | | | | 312,318(10)<br>110,112(10)<br>/CT(10) |

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|---|---|---|---|---|---|---|---|
| Cubes<br><br>Pairs of rods<br><br>Other familiar materials | | | | | | | 313,318(10)<br>/CT(7)<br>314-5,318<br>(10)/CT(1)<br>316-8(10)/<br>CT(2) |
| CHAPTER REVIEWS | 215(10)<br>75(10) | 248-9(10)<br>88(10) | 270-1(10)<br>96(9) | 288-9(10)<br>101(10) | 301(10)<br>105(10) | 309(10)<br>109(10) | 321(10)<br>112(9) |
| CUMULATIVE REVIEWS<br>("Keeping in Touch") | 214(10) | 246-7(10) | 268-9(10) | 286-7(10) | 300(10) | 310-11(10) | 320(10) |

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|---|---|---|---|---|---|---|---|---|
| I. SET CONCEPTS | | | | | | | | |
| 1. Identify special sets | | | | | | | | |
| Empty set | | | | 86(1)[a] | | | | |
| 2. Recognize and relate concept of set to | | | | | | | | |
| Ordered pairs | | | | | | 125(10) | | |
| Fractions | | | | | | 48(10)[b] | | |
| Equivalent fractions | (See XII-1) | | | | | 126,127(10)<br>46,50(10) | | |
| 3. Identify operations on sets | | | | | | | | |
| Union | | | | 86(2) | | | | |
| Intersection | | | | 86(2) | | | | |
| II. PLACE VALUE | | | | | | | | |
| 1. Identify place value names and place value positions up to | | | | | | | | |
| 12th place (whole numbers) | 2,3(10)<br>1,7(10)/<br>CT(7)[c] | | | | | | | |
| 3rd place (decimals) | (See XII-6) | | | | | | | |
| 2. Place whole numbers in expanded notation or compact form | 4,12(10)<br>2,7(6)/CT<br>(1) | | | | | | | |
| 3. Solve expanded numeral equations by identifying the missing digits | 4,5(10)<br>2(10) | | | | | | | |
| 4. Solve place value problems by use of | | | | | | | | |
| Abacus | 1(1) | | | | | | | |
| Computer model | 1,2,3(10) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 5. Code and decode place value problems base 10 with other number systems | | | | | | | | |
| Tally system | 1(1) | | | | | | | |
| Base 4 | (See XXI-3) | | | | | | | |
| Base 6 | (See XXI-3) | | | | | | | |
| Base 8 | (See XXI-3) | | | | | | | |
| III. OPERATIONS | (See Processes) | | | | | | | |
| IV. SEQUENCES | | | | | | | | |
| 1. Identify or construct sequences | | | | | | | | |
| Number patterns | | | | 82(4) | | | | 184-7,198 (3)<br>60,62,66 (10)/CT(5) |
| Fractional numbers | (See XII-4) | | | | | | | |
| Repeating decimals | (See XII-9) | | | | | | | |
| V. INEQUALITIES | | | | | | | | |
| 1. Compare numbers | | | | | | | | |
| Whole numbers | 5(10)<br>2(10)/CT(1) | | 46(9) | | | | | 196-7(10)<br>68(10) |
| Fractions | (See XII-2) | | | | | | | |
| Decimals | (See XII-7) | | | | | | | |
| 2. Compare products and factors | | | | | | | | 196-7(10)<br>68(10) |
| VI. NOTATION | | | | | | | | |
| 1. Code and decode expressions with exponents | | | | | | | | |
| Base 10 | 10-12(10)<br>4(10)/CT(4) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Base 10 scientific notation<br>Bases other than 10 | | | 52(10)<br>20(10)/CT (2) | | | | | |
| 2. Determine opposites of whole numbers | (See XXI-5) | | | | | | | |
| VII. NUMBER FACTS<br>1. Recall number facts in use of functions<br>Addition | | 21,24,26 (10)<br>8,9,10(10) /CT(3) | | | | | | |
| Subtraction | | 24,26(10)<br>11(10)/CT (2) | | | | | | |
| Multiplication | | 21,26(10)<br>8,9,10(10) /CT(10) | | | | | | |
| Division | | 26(10)<br>11(10)/CT (2) | | | | | | |
| VIII. EQUATIONS AND SOLUTIONS<br>1. Solve equations using variables a,b,c... | 11(10) | 10-1(10)/ CT(10) | 52(10)/ CT(2) | | | | | |
| 2. Solve equations finding missing<br>Addend | | 24(8)<br>10(5)/CT (1) | | | | | | |
| Factor | | 25(8)<br>14(8)/CT (7) | | | | | | |

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| 3. Solve equations with operations | | | | | | | | |
| Addition and subtraction | | 24(10)<br>10(10)/CT (5) | | | | | | 148(10)<br>54,55(10) |
| Multiplication and division | | 25(10)<br>11,14(10)/CT(10) | | | | | | |
| 4. Write equations using whole numbers | | 28(9)<br>12,13(10)/CT(3) | | | | | | |
| 5. Solve equations using % | | | | | | | | |
| IX. NUMBER LINE | | | | | | | | |
| 1. Perform operations using a number line | | | | | | | | |
| Addition | | | | | | | | |
| --Whole numbers | | | 40(6)/CT (1) | | | | | |
| --Fractions | (See XII-1) | | | | | | | |
| --Integers | (See XXI-7) | | | | | | | |
| Subtraction | | | | | | | | |
| --Whole numbers | | | 42(6)/CT (1) | | | | | |
| --Fractions | (See XII-1) | | | | | | | |
| Multiplication | | | | | | | | |
| --Fractions | (See XII-1) | | | | | | | |
| 2. Identify points on number line with | | | | | | | | |
| Fractions | (See XII-1) | | | | | | | |
| Decimals | (See XII-8) | | | | | | | |
| 3. Relate labeled points on number line with specified jumping operations | | | | | | | | 179(10)<br>59(3) |

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|---|---|---|---|---|---|---|---|---|
| 4. Graph sets of points on the number line | | | | | | | | |
| X. BASIC PRINCIPLES | | | | | | | | |
| 1. Recognize basic principles of mathematical operations | | | | | | | | |
| Associative principle | | | | | | | | |
| --Addition of whole numbers | | 33(3)<br>13(2)/CT (1) | | | | | | |
| --Addition of fractions | (See XII-3) | | | | | | | |
| --Addition of integers | (See XXI-6) | | | | | | | |
| --Multiplication of whole numbers | | 33(3)<br>13(2) | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | | |
| Commutative principle | | | | | | | | |
| --Addition of whole numbers | | 33(3)<br>13(3)/CT (1) | | | | | | |
| --Addition of fractions | (See XII-3) | | | | | | | |
| --Addition of integers | (See XXI-6) | | | | | | | |
| --Multiplication of whole numbers | | 33(5)<br>13(2) | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | | |
| Distributive principle | | | | | | | | |
| --Multiplication of whole numbers | | 33(7)<br>13(2) | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | | |
| One principle | | | | | | | | |
| --Multiplication of whole numbers | | 33(10)<br>13(4) | | | | | | |
| --Multiplication of fractions | (See XII-3) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Zero principle<br>--Addition of whole numbers<br>--Addition of fractions<br>--Addition of integers | (See XII-3)<br>(See XXI-6) | 33(10)<br>13(2) | | | | | | |
| XI. PROCESSES (ALGORITHMS)<br>1. Use algorithms for addition of<br>Whole numbers (renaming)<br>--1-2 digit numerals | | 22,24(10)<br>10,15(10)/CT(3) | 40(10)<br>16,27(7)/CT(3) | | | | | |
| --3-digit numerals | | | 40(8)<br>16,27(6)/CT(2) | | | | | |
| --4-digit numerals | | | 40(8)<br>16(1)/CT(1) | | | | | |
| Fractions<br>--Equivalent fractions<br>--Mixed numerals and improper fractions | (See XII-5) | | | | | | | |
| Decimals<br>--1-decimal digit<br>--2-decimal digits<br>--3-decimal digits | (See XII-10) | | | | | | | |
| Integers<br>--1-digit numerals | (See XXI-7) | | | | | | | |
| 2. Use algorithms for subtraction of<br>Whole numbers (renaming)<br>--1-2 digit numerals | | 24(10)<br>10,15(10)/CT(2) | 42(3)<br>16,27(5) | | | | | |

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|---|---|---|---|---|---|---|---|---|
| --3-digit numerals | | | 42(10)<br>16,27(7)/CT(3) | | | | | |
| --4-digit numerals | | | 42(9)<br>16(1)/CT(3) | | | | | |
| Fractions | (See XII-5) | | | | | | | |
| --Equivalent fractions | | | | | | | | |
| Decimals | (See XII-10) | | | | | | | |
| --1-decimal digit | | | | | | | | |
| --2-decimal digits | | | | | | | | |
| --3-decimal digits | | | | | | | | |
| Integers | (See XXI-7) | | | | | | | |
| --1-digit numerals | | | | | | | | |
| 3. Use algorithms for multiplication of | | | | | | | | |
| Whole numbers | | | | | | | | |
| --One factor of 1-2-digits | | 22-5(10)/11,15(10)/CT(10) | 46-8(10)<br>17,18,27(10)/CT(2) | | | | | |
| --One factor of 3-digits | | | 46-8(10)<br>17,18,27(10)/CT(1) | | | | | |
| --One factor of 4-digits or more | | | 46-7,49(10)<br>17,18(7) | | | | | |
| --Two factors of 2-digits each | | | 47-8(10)<br>17,18(10)/CT(1) | | | | | |
| --Two factors of 3-digits each | | | 49(10)<br>17, 18(7)/CT(1) | | | | | |
| Fractions | (See XII-5) | | | | | | | |
| --Two factors in fractional form | | | | | | | | |
| --Two factors in mixed numeral form | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Decimals<br>--One factor of 1-decimal digit<br>--One factor of 2-decimal digits<br>Integers<br>--1-digit numerals | (See XII-10) | | | | | | | |
| 4. Use algorithms for division of | | | | | | | | |
| Whole numbers<br>--1-digit divisors | | 25(10)<br>11,15(10)/CT(2) | 56-7,61(10)<br>21,27(10)/CT(1) | | | | | |
| --2-digit divisors | | | 56,61,67(10).<br>22-24,27(10)/CT(2) | | | | | |
| --Check division | | | 61(10) | | | | | |
| --Remainders in division | | | 61,67(10)<br>21(10)/CT(3) | | | | | |
| --Zeros in quotient | | | 68,69(10)<br>21,24-5(10)/CT(1) | | | | | |
| Fractions<br>--Associate improper fractions with mixed numerals<br>--Determine reciprocal of fractions<br>--Determine the quotient of two rational numbers | (See XII-5) | | | | | | | |
| Decimals<br>--Whole number divisor<br>--1-decimal dividend<br>--2-decimal dividend<br>--3-decimal dividend | (See XII-10) | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| --Decimal divisor<br>--1-decimal digit<br>--2-decimal digits<br>--3-decimal digits | | | | | | | | |
| XII. RATIONAL NUMBERS<br>1. Recognize and relate properties of fractions<br>Identify related properties of fractions<br>--Sets of equivalent fractions | (See I-2) | | | | | | | |
| --Fractions in lowest form | | | | | | 128(10)<br>47(10)/CT(4) | | |
| --Least common denominators | | | | | | | 142-3(10)/<br>CT(4) | |
| Relate fractions to<br>--Regions | | | | | | 124(10)<br>46(10)<br>130(6)<br>48,50(10)/<br>CT(3) | | |
| --Rational numbers | | | | | | | | |
| --Names for rational numbers | | | | | | 131,134(10)<br>48,50(10)<br>134(10)/<br>CT(2) | | |
| --Whole numbers | | | | | | | | |
| --Mixed numerals | | | | | | | 148(10)/<br>CT(4) | |
| --Number line | | | | | | 130-1,133-<br>4(10)<br>48,50(10)/<br>CT(2) | | |
| 2. Compare two fractions<br>Equalities<br>Inequalities | | | | | | 132(10)<br>133(10)<br>49,50(10)/<br>CT(8) | | |

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|---|---|---|---|---|---|---|---|---|
| 3. Recognize and use basic principles for operations with fractions | | | | | | | | |
| Commutative principle (addition) | | | | | | | 150(9)<br>55(10)<br>150(9) | |
| Associative principle (addition) | | | | | | | 55(10)<br>150(6) | |
| Identity principle (addition) | | | | | | | | |
| Commutative principle (multiplication) | | | | | | | | 168(9)<br>60(10)<br>169(10) |
| Associative principle (multiplication) | | | | | | | | 60(10)<br>169(4) |
| Identity principle (multiplication) | | | | | | | | 60(8)<br>177(10) |
| Addition and multiplication principle (distributive) | | | | | | | | 62(10) |
| 4. Recognize sequences of fractions | | | | | | | | 175,185,<br>198(3) |
| 5. Use algorithms for Addition of fractions | | | | | | | | |
| --Equivalent fractions | | | | | | | 138-44,150,<br>152(10)<br>51,52(10)/<br>CT(7) | |
| --Mixed numerals and improper fractions | | | | | | | 152,158(10)<br>54,56,58(10)<br>/CT(4) | |
| Subtraction of fractions | | | | | | | 138,140-5<br>(10)<br>51,52,56,58<br>(10) | |
| Multiplication of fractions | | | | | | | | |
| --Proper form | | | | | | | | 165,170-1,<br>175(10)<br>59,60,61<br>(10)/CT(8) |

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|---|---|---|---|---|---|---|---|---|
| --Improper form and mixed numerals | | | | | | | | 177(10)<br>59,62(10)/CT(5) |
| --Reciprocals | | | | | | | | 174(10)/CT(1) |
| Division of fractions | | | | | | | | |
| --Improper form and mixed numerals | | | | | | | 159(10) | 64-66,70 |
| --Reciprocals | | | | | | | 57(10) | (10)/CT(3)<br>185(10)/CT(1) |
| --Quotient of two rational numbers | | | | | | | | 188(10)<br>64-6,70 |
| 6. Identify place value names and place value positions with decimals | | | | | | | | (10)/CT(1) |
| --Up to 3-decimal places | | | | | | | | |
| 7. Compare two decimals | | | | | | | | |
| 8. Relate decimals to points on the number line | | | | | | | | |
| 9. Recognize sequences of repeating decimals | | | | | | | | |
| 10. Use algorithms for | | | | | | | | |
| Addition of decimals | | | | | | | | |
| --1-decimal digit | | | | | | | | |
| --2-decimal digits | | | | | | | | |
| --3-decimal digits | | | | | | | | |
| Subtraction of decimals | | | | | | | | |
| --1-decimal digit | | | | | | | | |
| --2-decimal digits | | | | | | | | |
| --3-decimal digits | | | | | | | | |
| Multiplication of decimals | | | | | | | | |
| --One factor of 1-decimal digit | | | | | | | | |
| --One factor of 2-decimal digits | | | | | | | | |
| Division of decimals | | | | | | | | |
| --Whole number divisor --1-decimal dividend | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| --2-decimal dividend | | | | | | | | |
| --3-decimal dividend | | | | | | | | |
| --Decimal divisor | | | | | | | | |
| --1-decimal digit | | | | | | | | |
| --2-decimal digits | | | | | | | | |
| --3-decimal digits | | | | | | | | |
| 11. Associate percent with rational numbers | | | | | | | | |
| 12. Solve word problems with percent related to | | | | | | | | |
| Money | | | | | | | | |
| Area | | | | | | | | |
| Other | | | | | | | | |
| XIII. RATIO AND PROPORTION | | | | | | | | |
| 1. Identify equal ratios | | | | | | | | |
| 2. Relate ratios to | | | | | | | | |
| Measurement | | | | | | | | |
| Expression of rate | | | | | | | | |
| Compare 2 sets according to the number of objects in each | | | | | | | | |
| 3. Relate ratios to length of sides of triangles | | | | | | | | |
| 4. Use ratios in word problems | | | | | | | | |
| XIV. PROBLEM SOLVING | | | | | | | | |
| 1. Solve verbal problems involving multiple operations | | 30(10)<br>12(10)/CT<br>(3) | | | | | | |
| 2. Solve verbal problems involving special topics | | | | | | | | |
| Places | | | | | | | | |
| --Washington, D.C. | | | 53(6) | | | | | |
| --Cape Kennedy | | | | | | | 147(5) | |
| --Egyptian pyramids | | | | 93(5) | | | | |

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|---|---|---|---|---|---|---|---|---|
| Animals | | | | | | | | |
| --Birds | | | 50-1(9) | | | | | |
| --Horses | | | 70-1(9) | | | | | |
| Machines | | | | | | | | |
| --Rockets | | | 63(6) | | | | | |
| --Automobiles | | | | | | | 157(7) | |
| Human body | | | | | | | | |
| Falling bodies | | | | | | | | |
| Density | | | | | | | | |
| Averages, means | | | 62(7)<br>23(10)/CT(3) | | | | | |
| Interest and percent discount | | | | | | | | |
| Rate, time, distance and money | | | 74(10)<br>19,26,27(10)/CT(2) | | | | | 67(1) |
| Recipes, liquid measure | | | | | | | 155(8)<br>53(3)/CT(1) | 63,70(4)/CT(1) |
| Temperature | | | 55(9) | | | | | |
| XV. LOGIC | | | | | | | | |
| XVI. NUMBER THEORY | | | | | | | | |
| 1. Identify factors of numbers | | | | 80-1(10)<br>28(10)/CT(9) | | | | |
| 2. Identify numbers divisible by | | | | | | | | |
| 2 | | | | 82(7)<br>29(1)/CT(10) | | | | |
| 3 | | | | 82(7)<br>29(1)/CT(10) | | | | |
| 5 | | | | 82(5)<br>29(1)/CT(5) | | | | |

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|---|---|---|---|---|---|---|---|---|---|
| 3. | Identify factor trees | | | | 83(10)<br>28,33(7)/<br>CT(4) | | | | |
| 4. | Identify least common multiple | | | | 88-9(10)<br>31,33(10)/<br>CT(3) | | | | |
| 5. | Identify greatest common divisor | | | | 87(10)<br>30,33(10)/<br>CT(2) | | | | |
| 6. | Identify prime numbers | | | | 84,86(10)<br>29,33(10)/<br>CT(10) | | | | |
| 7. | Identify composite numbers | | | | 84(10)/CT<br>(10) | | | | |
| 8. | Determine prime factorization for given numbers | | | | 85(10)<br>29(10)/CT<br>(1) | | | | |
| 9. | Solve problems using special sets of numbers | | | | 86(10)/<br>CT(1) | | | | |
| 10. | Solve equations using<br>12-clock arithmetic<br><br>5-clock arithmetic | | | | <br>90(10)<br>32(6)<br>91(10) | | | | |
| XVII. | ESTIMATION | | | | | | | | |
| 1. | Estimate results of mathematical operations<br>Multiplication<br>Division | | | <br><br>58(5) | | | | | |
| 2. | Estimate<br>Population<br>Circumference of circle<br>Area of circle<br>Miles, speed, cost<br>Length, thickness, width | | | | | | | <br><br><br><br>147(2)<br><br>147(2)<br>147(1) | |
| 3. | Estimate results in short stories | | | | | | | | 200-1(10)<br>69(6) |

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|---|---|---|---|---|---|---|---|---|
| 4. Compare numbers<br>Decimals with decimals or mixed numbers<br>Whole numbers with fractions | | | | | | | | 196(10)/CT(1) |
| 5. Round numbers to nearest whole number, tenth, or hundredth | 8-9(10)<br>3(10)/CT(2) | | | | | | | 198(10) |
| XVIII. MEASUREMENT | | | | | | | | |
| 1. Recognize and use systems for linear measurement | | | | | | | | |
| Centimeter | | | | | 101(2)<br>35,45(2)/CT(1) | | | |
| Inch | | | | | 101(2)<br>35(1) | | | 63(3)/CT(1) |
| Mile | | | | | 101(2) | | | 67(1) |
| Kilometer | | | | | 101(1) | | | |
| 2. Measure circumference of circle | | | | | | | | |
| 3. Measure perimeter of polygons | | | | | 107(10)<br>38(4) | | | |
| 4. Measure length of sides of rectangles | | | | | | | | |
| 5. Determine length of sides of triangles or areas of squares using Pythagorean Theorem | | | | | 115(10)<br>43(4)/CT(2) | | | |
| 6. Determine area of<br>Rectangles | | | | | 108(10)<br>39(10)/CT(2) | | | 63(1) |
| Triangles | | | | | 113-4(10)<br>42,45(7)/CT(2) | | | |
| Circles | | | | | | | | |
| Surfaces | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 7. Determine volume of rectangular prisms | | | | | | | | |
| 8. Determine measure of angles | | | | | 104(10) | | | |
| 9. Recognize and use indirect measure | | | | | | | | |
| 10. Measure circumference of circle to approximate pi ($\pi$) | | | | | | | | |
| 11. Measure scale drawings | (See XX) | | | | | | | |
| XIX. GEOMETRY | | | | | | | | |
| 1. Recognize and construct basic figures | | | | | | | | |
| Lines | | | | | | | | |
| --Parallel | | | | | 116-8(8)<br>44-5(10)/CT(2) | | | |
| --Perpendicular | | | | | 116(2)<br>44(2)/CT(1) | | | |
| --Intersection | | | | | 116-7(2) | | | |
| Line segments | | | | | 99,100(10)<br>34-5,45(10)/CT(3) | | | |
| Points | | | | | 96-7(10)<br>34(1) | | | |
| Rays | | | | | 99(2)<br>34(4)/CT(1) | | | |
| Angles | | | | | | | | |
| --Right | | | | | 103(1)<br>36(1) | | | |
| --Congruent | | | | | 102(7)<br>34,36,45(5)/CT(1) | | | |
| --Bisected | | | | | 103(2)<br>36(1) | | | |
| --Degree and radian measure | | | | | 105(10)<br>37,45(7)/CT(1) | | | |

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|---|---|---|---|---|---|---|---|---|
| 2. Construct geometric shapes and/or state relationships among various components | | | | | | | | |
| Triangle | | | | | | | | |
| --Construction | | | | | 112(7)<br>34,40(7)<br>110(10)<br>40(4)/CT(1) | | | |
| --Congruent | | | | | | | | |
| --Area (See XVIII-6) | | | | | | | | |
| Right Triangle (See XVIII-5) | | | | | | | | |
| --Pythagorean Theorem (See XVIII-5) | | | | | | | | |
| --Ratios of sides (See XVIII-9) | | | | | | | | |
| --Hypotenuse (See XVIII-9) | | | | | | | | |
| Polygons | | | | | | | | |
| --Area of rectangles (See XVIII-6) | | | | | | | | |
| --Similar (See XVIII-9) | | | | | | | | |
| --Perimeter (See XVIII-3, 4) | | | | | | | | |
| Circles | | | | | | | | |
| --Tangent, radius, diameter | | | | | | | | |
| --Area (See XVIII-6) | | | | | | | | |
| --Chord | | | | | | | | |
| --Circumference (See XVIII-2) | | | | | | | | |
| --Pi ($\pi$) (See XVIII-10) | | | | | | | | |
| --Protractor | | | | | 104,120(10) | | | |
| Closed curve | | | | | 106(4) | | | |
| 3. Construct space figures and/or state relationships among various components | | | | | | | | |
| Cross sections | | | | | | | | |
| The 5 regular solids | | | | | | | | |
| Cubes | | | | | | | | |
| --Faces | | | | | | | | |
| --Edges | | | | | | | | |
| --Vertices | | | | | | | | |
| Surface area (See XVIII-6) | | | | | | | | |
| Geometric planes | | | | | 96(1) | | | |
| Sphere | | | | | | | | |
| Cylinder | | | | | | | | |
| Cone | | | | | | | | |
| Octahedron | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| Prisms | | | | | | | | |
| --Triangular | | | | | | | | |
| --Hexagonal | | | | | | | | |
| --Rectangular | | | | | | | | |
| Pyramids | | | | | | | | |
| --Square | | | | | | | | |
| --Rectangular | | | | | | | | |
| 4. Identify measures in geometric illusions | | | | | | | | |
| 5. Recognize and use concepts from coordinate geometry | (See XX-3) | | | | | | | |
| XX. GRAPHS AND SCALE DRAWINGS | | | | | | | | |
| 1. Use maps and graphs as aids in solving verbal problems | | | | | | | | |
| Bar graphs | | | 70(4) | | | | | |
| Circle graphs | | | | | | | | |
| Charts | | | | | | | 156(8) | |
| Pictographs | (See XIV-2) | | | | | | | |
| Geographic maps | | | 41,43(10) | | | | | |
| Line graphs | | | | | | | | 193(10) |
| Scale drawings | | | | | | | | 194(10) |
| 2. Use number line to graph sets of points | | | | | | | | |
| 3. Use number plane to graph | | | | | | | | |
| Whole number pairs | | | | | | | | |
| Rational number pairs | | | | | | | | |
| Functions | (See XXI-2) | | | | | | | |
| XXI. SPECIAL TOPICS | | | | | | | | |
| 1. Use function rules to supply missing numbers | | | | | | | | |
| One function | | 21-2,37(10)<br>8-9,15(10)/CT(8) | | | | | 154(10) | 178(10) |
| Composite functions | | 26-7(10) | | | | | | |

ADDISON-WESLEY INSTRUCTIONAL OUTCOMES
GRADE 6



| UNIT<br>PAGES | 1<br>1-19 | 2<br>20-39 | 3<br>40-79 | 4<br>80-95 | 5<br>96-123 | 6<br>124-137 | 7<br>138-163 | 8<br>164-205 |
|---|---|---|---|---|---|---|---|---|
| 2. Graph functions | | | | | | | | |
| 3. Name numbers in bases other than base 10 | | | | | | | | |
| Base 4 | 15(2)<br>5(2) | | | | | | | |
| Base 6 | 15-8(10)<br>5-6(10)/CT (5) | | | | | | | |
| Base 8 | 15(2)<br>5(2) | | | | | | | |
| Other bases | 5(2) | | | | | | | |
| 4. Solve verbal problems using integers | | | | | | | | |
| 5. Determine opposites of whole numbers | | | | | | | | |
| 6. Recognize and use basic principles for addition of integers | | | | | | | | |
| 7. Perform operations on integers | | | | | | | | |
| Addition | | | | | | | | |
| Subtraction | | | | | | | | |
| Order | | | | | | | | |
| 8. Perform experiments to determine probabilities of outcomes | | | | | | | | |
| Coins | | | | | | | | |
| Cubes | | | | | | | | |
| Pairs of rods | | | | | | | | |
| Other familiar materials | | | | | | | | |
| CHAPTER REVIEWS | 19(10)<br>7(10) | 39(10)<br>15(10) | 78-9(10)<br>27(10) | 94-5(10)<br>33(10) | 123(10)<br>45(10) | 137(10)<br>50(10) | 162-3(10)<br>58(10) | 204-5(10)<br>70(10) |
| CUMULATIVE REVIEWS ("Keeping in Touch") | | 38(10) | 76-7(10) | 92-3(10) | 122(10) | 136(10) | 160-1(10) | 202-3(10) |

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